D-583-7-5-11
Revision 1

WELLS G & H SITE
REMEDIAL INVESTIGATION REPORT
PART I
WOBURN, MASSACHUSETTS

TDD NO. F1-8607-07
NUS JOB NO. MA11RF
EPA SITE NO. MAD980732168
CONTRACT NO. 68-01-6699

VOLUME III: APPENDICES A & B

FOR THE

REGION I
US EPA
WASTE MANAGEMENT DIVISION

OCTOBER 17, 1986

NUS CORPORATION
SUPERFUND DIVISION

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APPENDIX A
SCOPE OF WORK FOR NUS/FIT REMEDIAL INVESTIGATION

D-583-5-4-15
Revision 4.0

SCOPE OF WORK
FOR A
REMEDIAL INVESTIGATION AT
WELLS G & H SITE
WOBURN, MASSACHUSETTS

TDD NO. F1-8405-02
NUS JOB NO. MA 11
EPA SITE NO. MAD 980 732 168
CONTRACT NO. 68-01-6699

FOR THE

REGION I
US EPA
MA/CT/VT SITE RESPONSE SECTION

October 19, 1984

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CONTENTS

ILLUSTRATIONS

1.0 INTRODUCTION

The NUS Region I Field Investigation Team (NUS/FIT) has been tasked by the Region I EPA MA/CT/VT Site Response Section (EPA) under Technical Directive Document (TDD) Nos. F1-8311-06 and F1-8405-02 to conduct a Remedial Investigation (RI) of the Wells G & H Site in Woburn, Massachusetts (Appendix A).

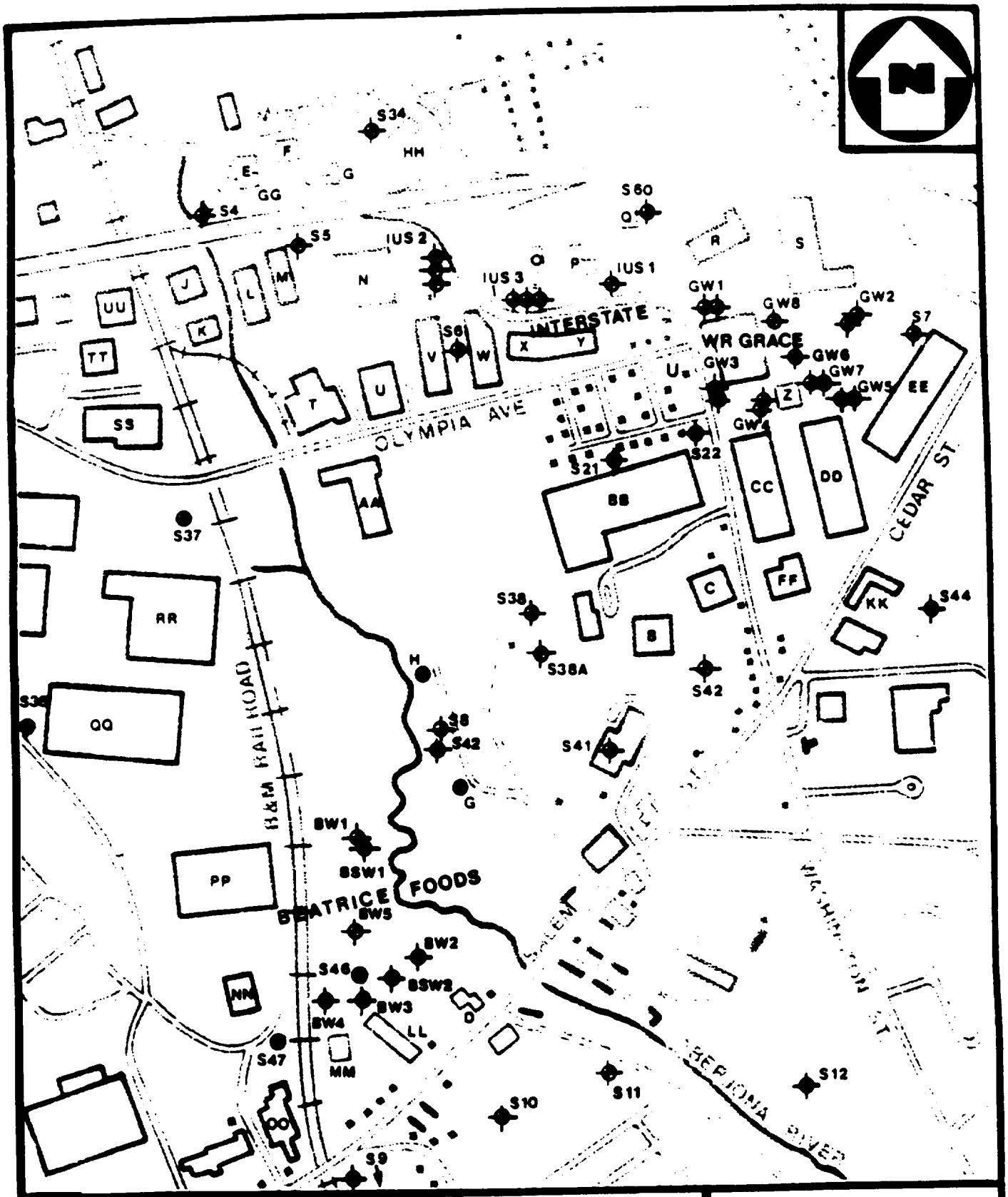
The Remedial Investigation will be in support of a Feasibility Study (FS) being conducted by GCA Corporation of Bedford, Massachusetts, under contract to EPA. This document presents the Scope of Work for the Remedial Investigation and incorporates extensive review by EPA and Massachusetts Division of Environmental Quality Engineering (DEQE).

1.1 Background

In May 1979, several chorinated volatile organic compounds (1,1,1-trichloroethane, 1,2-trans-dichlorethylene, tetrachloroethylene, trichloroethylene, chloroform, and trichlorotrifluoroethane) were detected at concentrations ranging from 1-400 parts per billion by the DEQE in the City of Woburn's municipal drinking water Wells G & H (Figure 1). Wells G & H were subsequently shut down, forcing the City of Woburn to use MDC water to supplement its other groundwater wells (1).

As a result of the detected contamination, the previous FIT contractor, Ecology and Environment Inc. (E & E), was tasked by EPA to conduct a hydrogeologic investigation and groundwater quality evaluation of a ten square mile portion of East and North Woburn (Figure 2, 3). E & E's work identified that the major groundwater problem within the study area was widespread contamination by chorinated volatile organic compounds. The volatile compounds found in highest concentration were trichloroethylene, 1,2-trans-dichloroethylene, 1,1,1-trichloroethane and tetrachloroethylene.

The highest concentrations (>300 ppb) of trichloroethylene and 1,2-trans-dichloroethylene were detected at well S-21 and well S-46 (Figure 1). Well S-46



0 500 1000
SCALE FEET
APPROXIMATE

LEGEND: Accessible wells; Inaccessible wells; Production wells

SITE PLAN

EAST WOBURN SITE

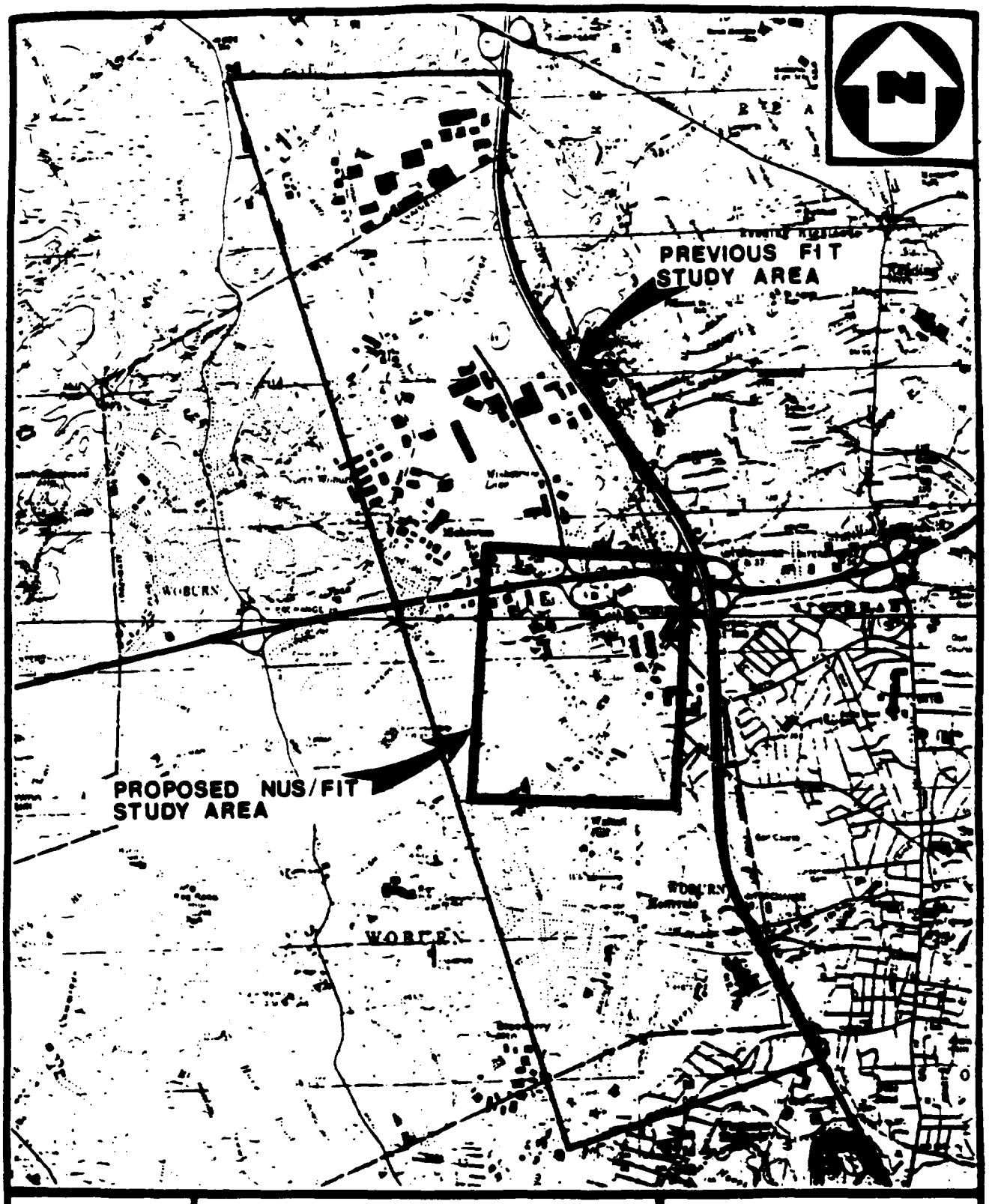
WOBURN, MASSACHUSETTS

MAY 1984

NUS CORPORATION
A Halliburton Company

FIGURE 1

BASE MAP DERIVED FROM U.S.G.S. LEXINGTON, BOSTON NORTH, READING & WILMINGTON QUADRANGLES 1971.1979 & 1980 AERIAL PHOTOGRAPHS OF EAST WOBURN, MA



SCALE: 0 1/2 mile
APPROXIMATE

LOCATION MAP OF STUDY AREA

EAST WOBURN SITE
WOBURN, MASSACHUSETTS
MAY 1984

NUS CORPORATION
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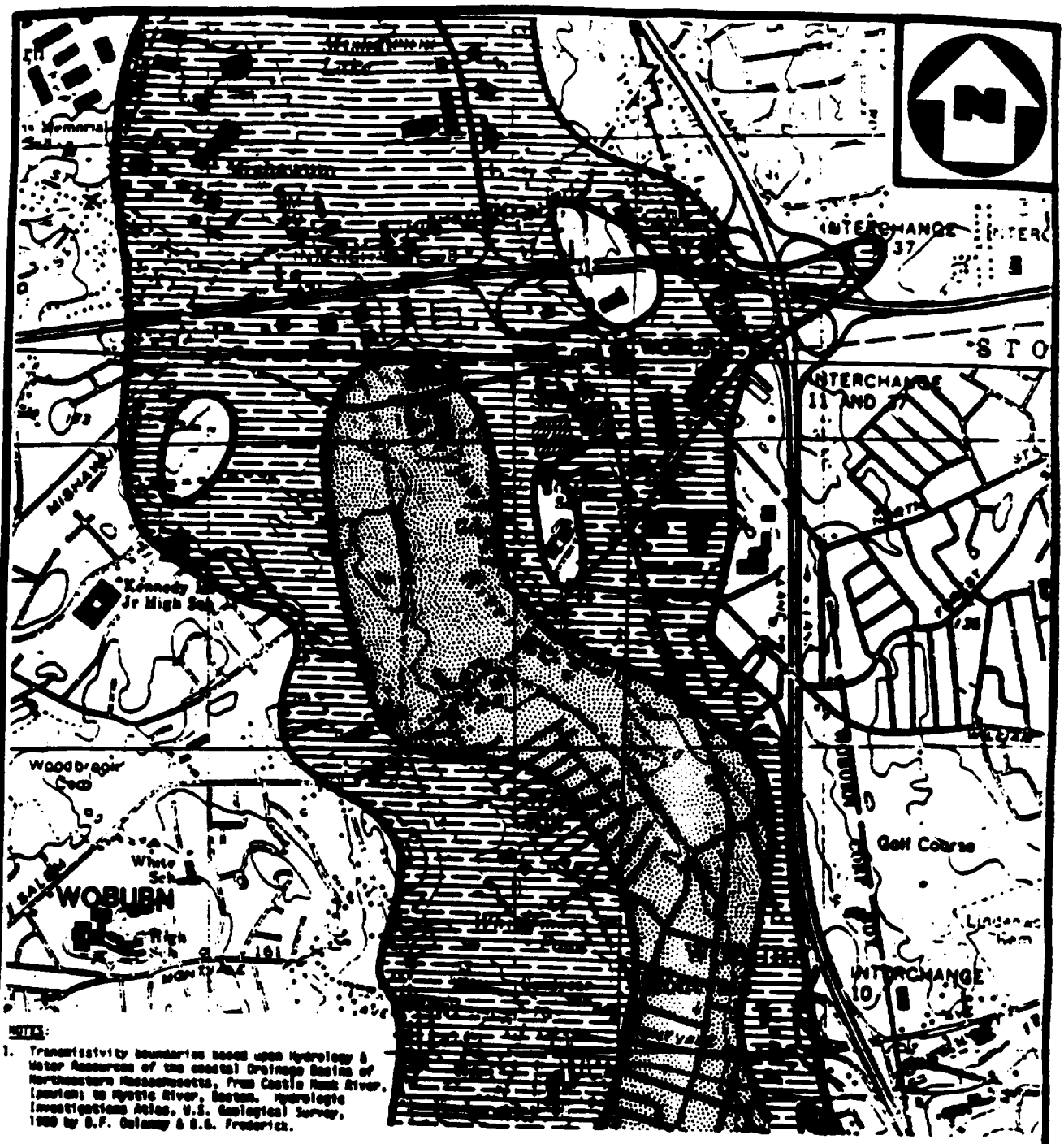
FIGURE 2

BASE MAP IS A PORTION OF THE U.S.G.S. LEXINGTON BOSTON NORTH READING & WILMINGTON QUADRANGLE (7.5' SERIES, 1971 1979).

KEY FOR FIGURE 1

A. AVA-Warehouse
B. Cummings Industrial Centers - Offices
C. Cummings Industrial Centers - Offices
D. Aberjona Auto Parts
E. Arlwood, Inc. - Wood/Metal doors, hardware
F. Brodie, Inc. - Industrial trucks, tractors
G. Brodie, Inc. - Industrial trucks, tractors
H. Post Office
I. Bradlee's - Commercial
J. Celotex Corporation - Warehouse
K. Economics Lab, Inc. - Distributor of soap and cleaning compounds
L. ADAP/Kamco. - Commercial, auto parts
M. Waterbed Warehouse - Commercial
N. Charrette - Commercial, art supplies
O. Woburn Foreign Motors
P. Hogan Tire Company - Tire distributor
Q. Bliss Marine - Boating equipment
R. Hurlbert Datsun - Automobile sales and repair
S. Cummings Industrial Centers - Offices
T. Northern Research and Engineering Corporation
U. Continental Metal Products - Hospital equipment
V. Cummings Industrial Centers - Offices
W. Cummings Industrial Centers - Offices
X. Interstate Industrial Uniform Rental
Y. Metro Siding and Roofing
Z. W.R. Grace - Food wrapping equipment
AA. Hemingway Transportation, Inc. - General commodities trucking
BB. Cummings Industrial Centers - Offices
CC. Cummings Industrial Centers - Offices
DD. Cummings Industrial Centers - Offices
EE. Cummings Industrial Centers - Offices
FF. McKesson and Robbins Drug Company
GG. 99 Restaurant
HH. Koala Inn
II. New England Plastics - Plastics manufacturing
JJ. Mirra Construction Company, Inc.
KK. Independent Tallow Company
LL. Whitney Barrell
MM. Murphy Waste Oil
NN. Bioassays Systems Corp.
OO. J.J. Riley Tannery
PP. Lechmere Corp Offices
QQ. United Stationers
RR. Rohtstein Corp.
SS. Weyerhaeuser
TT. Mass Crinc
UU. 7-Up Distributor



TRANSMISSITY OF THE ABERJONA AQUIFER

EAST WOBURN SITE

WOBURN, MASSACHUSETTS

MAY 1984

NUS CORPORATION

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FIGURE 3

BASE MAP IS A PORTION OF THE U.S.G.S. LEXINGTON BOSTON NORTH READING & WILMINGTON QUADRANGLES [7.5' SERIES, 1971 1979]

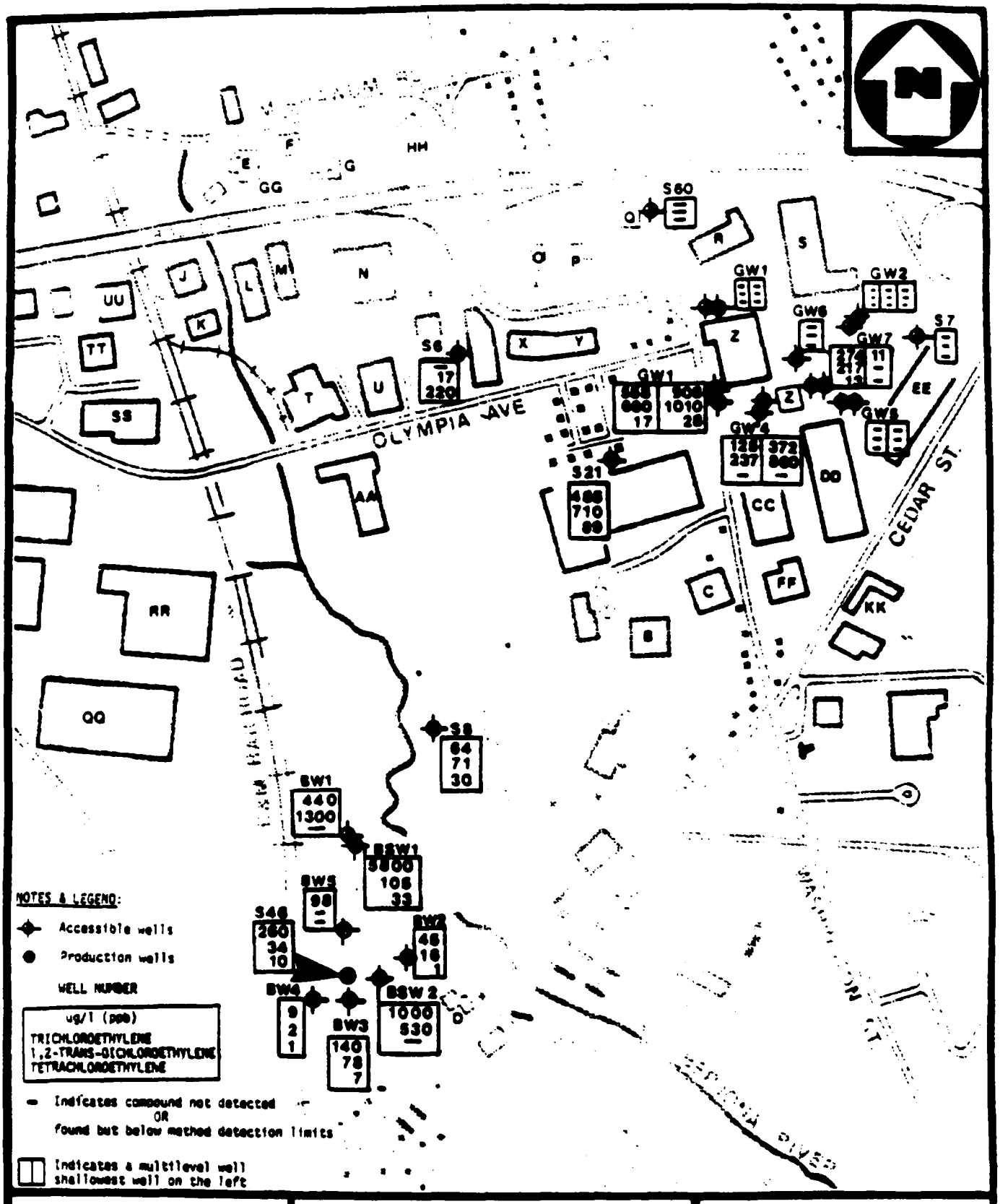
also contained high levels of 1,1,1,-trichloroethane (100-200 ppb). High levels of tetrachloroethylene (>200 ppb) were detected at Well S6, north of Wells G & H (Figure 1).

The E & E reports, "Chlorinated Solvent Contamination of the Groundwater, East and Central Woburn" (2) and "Evaluation of the Hydrogeology of East and North Woburn" (1), identified potential source areas for these compounds based on being upgradient of a specific organic compound's groundwater plume, the direction of groundwater flow relative to that plume, and site inspections of seventeen active and inactive facilities within and around the study area (see Figure 2). E & E suggested that the contamination detected at Wells G & H likely emanated from property(ies) north and/or northeast of these wells. E & E did not, however, identify the source area for the contamination present at Well S-46. The reader is referred to the previously referenced Ecology & Environment reports for more detailed information.

In May, 1983, as a result of E & E's investigations and subsequent studies by the EPA and DEQE, three orders (under Section 3013 of the Resource Conservation and Recovery Act-RCRA) were issued to W.R. Grace and Co., Inc. (Cryovac), Interstate Uniform Services Corp., and Beatrice Foods Inc. These orders required submission of proposals for sampling, analysis, monitoring, and reporting in relation to possible groundwater contamination on or emanating from their properties.

Subsequent groundwater monitoring well installations by the three companies are denoted on Figure 1 as follows: W.R. Grace - GW; Beatrice Foods - BW, BSW; and Interstate Uniform - IUS.

The work performed as a result of EPA's orders has aided in further delineating possible source areas of contamination to Wells G & H. Recent analytical data from these sampling surveys conducted by the concerned parties and NUS sampling surveys are presented in Figure 4.



RECENT ANALYTICAL RESULTS

EAST WOBURN SITE

WOBURN, MASSACHUSETTS

MAY 1984

NUS CORPORATION

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FIGURE 4

BASE MAP DERIVED FROM U.S.G.S. LEXINGTON, BOSTON NORTH, READING & WILMINGTON QUADRANGLES 1971,1979 & 1980 AERIAL PHOTOGRAPHS OF EAST WOBURN

1.2 Purpose/Objectives

The purpose of the Remedial Investigation is to determine the nature and extent of groundwater contamination at the Wells G & H site and gather all necessary data to support the work conducted during the feasibility study. The Wells G & H Site will be referred to in this scope of work as the Wells G & H aquifer area. The scope of the investigation will be focused on collecting the type and amount of data required to determine the need for and extent of remedial action, and for development and evaluation of off-site remedial alternatives during the subsequent feasibility study phase. The data collected will be sufficiently relevant, technically sound and defensible to support possible future enforcement actions against responsible parties which may include source control and/or cost recovery.

The Remedial Investigation will provide sufficient information and interpretation to achieve the following objectives:

- describe the geohydrology of the Wells G & H aquifer area including surface water and groundwater movement; and identify contaminant source areas, and describe pathways and mechanisms of contaminant transport,

- develop a geohydrologic and chemical data base sufficient to support a subsequent remedial action feasibility study that will determine the need for and extent of remedial action and will identify and evaluate the most cost-effective remedial actions for mitigating the effects of groundwater contamination at the Wells G & H aquifer area, and

- investigate suspected contaminant source areas, identify properties that are contributing contamination to the Wells G & H aquifer area, and collect information that is adequate to support successful enforcement actions and source control remedial action.

The following sections describe, in detail, the work NUS proposes for this Remedial Investigation to achieve the above objectives.

2.0 PLANNING CONSIDERATIONS

2.1 Subcontracting

NUS/FIT plans to utilize subcontractors for the following tasks: surveying, drilling and installation of groundwater monitoring wells, performance of grain size analysis, and in-situ permeability testing.

The proposed schedule presented in this Scope of Work includes the efforts required to prepare bid specification for the activities noted above, as well as the efforts required to procure subcontractors. Additionally, this Scope of Work includes the efforts by NUS/FIT to direct and oversee subcontractor activities in the field and to review subcontractor performance and work products. All of these estimates for level of effort assume that subcontractors can be procured on a timely basis, and that they can perform the work outlined in the bid specifications. If difficulties arise in negotiating subcontracts or working with subcontractors, additional efforts may be required, resulting in potential schedule delays and increased costs. In the event that such problems become evident, NUS/FIT will revise the schedule estimates.

2.2 Site Access

There are two areas of concern regarding site access: logistics and legal access. Logistical concerns are mainly drilling equipment access to wet portions of the site near the Aberjona River. Delays until drier conditions or procurement of the necessary equipment to access these areas may result in increased subcontractor costs.

Field activities have been planned to take into account the physical accessibility of the areas involved.

In terms of groundwater sampling, this Scope of Work assumes that NUS/FIT personnel will have sampling access to all EPA wells installed by either the former

FIT contractor (Ecology & Environment) or by NUS/FIT. Access will have to be procured for the wells belonging to W.R. Grace Co., Interstate Uniform, and Beatrice Foods.

All schedule and budget estimates presented in this Scope of Work are predicated on the ability of NUS/FIT staff and subcontractors to obtain fairly unlimited access to the study area throughout the course of field activities. EPA will assist NUS/FIT in obtaining access to all parts of the study area.

2.3 Health and Safety

All field tasks will require a task specific health and safety plan. These tasks include the initial sampling round, groundwater monitoring wells installations, final sampling, permeability testing and pump tests. The health and safety plan will define appropriate field clothing, breathing zone monitoring requirements and corresponding action levels, and personal decontamination procedures. Emergency planning will also be addressed. Actions levels for respiratory equipment and other requirements will be dictated by NUS regional and corporate policies as well as by site-specific conditions to be addressed in the safety plans. General guidelines for the specific field tasks are described in section 3.0. These guidelines will be subject to approval by the NUS Health and Safety Officer at the initiation of fieldwork.

2.4 Quality Assurance and Quality Control

All TDD-specific tasks are defined initially in a Management Work Plan. The technical approach to each field task is described in detail in a specific Task Work Plan. NUS/FIT Standard Operating Guidelines are used as a basis for developing task-specific procedures. Deviations or modifications to any guideline are detailed in the task work plan technical approach. All management and task work plans are reviewed internally and approved before initiation of any work.

Upon initiation of field activities, a copy of all appropriate Standard Operating Guidelines will be provided to EPA and DEQE. All deviations and modifications to

the guidelines will also be provided. Subsequent review and comment by EPA and DEQE will determine final Standard Operating Procedures for field work.

Standard Operating Guidelines will address, but not be limited to the following procedures: collection of quality control samples (duplicates and blanks), groundwater and surface water sampling, soil classification, monitoring well installation, and quality control review of analytical data. An overview of the Standard Operating Guidelines related to the major field tasks proposed in this study is presented in Appendix D. It is important to note that the guidelines presented are only an overview and are not all inclusive. Periodic audits of project files, field work or other elements will be conducted by the Region I Quality Assurance Officer to insure that divisional and regional quality assurance requirements are met.

All memos, trip reports and final reports require internal reviews and approval. A final draft report will be submitted to EPA and DEQE for internal review before a final report is issued. Quality Assurance will be achieved by adherence to Standard Operating Guidelines, internal audits and internal review.

3.0 PROPOSED SCOPE OF WORK

The boundaries of the Remedial Investigation study area will be Interstate I-95 (state route 128) to the north and Cedar/Salem Street to the south. The boundaries to the east and the west will be determined based on hydrologic factors (Figure 1). The areas beyond the study's northern and southern boundaries are within the Aberjona aquifer. In order to develop an extended data base for the feasibility study, groundwater samples will be collected from existing wells in these areas and studies conducted by responsible parties in North Woburn will be reviewed and evaluated.

In order to achieve the stated objectives, the Remedial Investigation will consist of the following activities conducted in three phases.

- Review existing data and conduct an initial groundwater and surface water sampling round to provide a current assessment of the extent, nature, and degree of contamination.

- Installation of over forty overburden and shallow bedrock groundwater monitoring wells in the study area to provide geologic and hydrologic data necessary in identifying pathways and mechanisms of contaminant transport and in identifying source areas of contamination.

- Conduct three rounds of surface water and groundwater sampling to include all newly installed monitoring wells in addition to those sampled in the first round, to contribute to the data base necessary to achieve the stated objectives.

- Conduct an aquifer test in the vicinity of Wells G & H to provide the data necessary to evaluate the feasibility and cost effectiveness of possible remedial actions.

- Presentation of all data and information in a final report that will describe the geohydrology of the Wells G & H aquifer area sufficient to support the feasibility study and identify those properties from which contamination to wells G & H emanates.

3.1 Phase I Activities

NUS/FIT was tasked on May 7, 1984 by EPA to begin Phase I activities under Technical Directive Document (TDD) Number F1-8405-02. Phase I activities include the following tasks:

- Task 01: Drafting Final Scope of Work
- Task 02: Review of Existing Data
- Task 03: Planning for Site Access
- Task 04: Preparation of a Base Map
- Task 05: Procurement of Subcontractors
- Task 06: Mobilization of Equipment
- Task 07: Performance of an Initial Round of Environmental Sampling

Awarding of subcontracts and initiation of Phase II activities will not occur until EPA has granted approval of the proposed scope of work. It is anticipated that approval could be granted within three weeks after receipt of the scope of work by EPA. Within this time, EPA must also determine whether any responsible parties are interested in conducting the Remedial Investigation. Each Phase I task is further described below.

Task 01 Drafting Final Scope of Work

An initial scope of work delivered to EPA on January 13, 1984 has been revised on the basis of comments received from EPA and DEQE. The revised (final) scope of work for a remedial investigation is presented in this document and represents the completion of this task.

Task 02 Review of Existing Data

NUS/FIT will review eight main areas of existing data:

- previous data collected by Ecology and Environment, the previous FIT contractor

- recent data collected during Whitman and Howard Inc.'s Infiltration/Inflow Analysis on the sewer line in the study area

- recent analytical and geohydrologic data collected in response to EPA 3013 orders by W.R. Grace, Beatrice Foods and Interstate Uniform

- boring data from construction of Cummings Park or other buildings, if available

- data collected during construction and initial exploratory testing of Wells G & H

- data collected concerning groundwater, surface water or soil contamination in North Woburn, north of state route 128, but within the hydrologic boundaries of the Aberjona aquifer

- data collected concerning groundwater, surface water or soil contamination south of Cedar/Salem Street, but within the hydrologic boundaries of the Aberjona aquifer

- surface water data collected from the study area by DEQE

The data from Ecology and Environment, local boring logs and the EPA 3013 orders will be used to aid in achieving the following study objectives: 1) describing the geohydrology of the Wells G & H aquifer area, 2) providing a geohydrologic basis for determining cost-effective remedial action and 3) identifying contaminant source areas contributing to contamination of the Wells G & H aquifer area.

Data collected by other parties from north of I-95 and south of Cedar/Salem Street, but within the hydrologic boundaries of the Aberjona aquifer will be used to support GCA's feasibility study. The primary focus of all review will be on data that provides the geohydrologic basis for determining the need for and extent of remedial action and the feasibility of various remedial alternatives.

Task 03 Planning for Site Access

Arrangements will be made to ensure that site access may be obtained for all NUS/FIT and subcontractor personnel. Since the NUS/FIT office is located nearby, there is no need to establish a separate project office on the site. Proposed groundwater and surface water sampling locations will be examined to verify that they can be utilized. Further discussion of site access is presented in Section 2.2.

Task 04 Preparation of Basemaps

Basemaps will be prepared, utilizing as a starting point the previous FIT Field Investigation basemap and aerial photos. A detailed basemap will depict the study area described in Sections 1.2 and 3.0. A general basemap that includes the hydrolgic boundaries of the aquifer will also be developed. The general basemap will include additional areas outside of the study area that will be addressed in support of the feasibility study (Section 3.0).

Task 05 Procurement of Subcontractors

Subcontractors capable of providing services for the Remedial Investigation will be identified. Subcontractors will be required for surveying, drilling and installation of groundwater monitoring wells, and performance of grain size analysis and in-situ permeability testing. Actual bid specifications will be prepared under Phase I, but will not be issued until authorization to proceed with the scope of work has been received.

Task 06 Mobilization of Equipment

Major pieces of equipment, such as dedicated project truck and OVA, will be obtained and prepared for field use. Disposable equipment will be ordered, and other equipment needs will be identified for the upcoming field activities.

Task 07 Performance of an Initial Round of Environmental Sampling

An initial sampling round will be conducted prior to the start of field activities. The purpose of this sampling round will be to assess the current extent of surface water and groundwater contamination. As currently envisioned, samples will be collected from approximately twenty-four groundwater sampling locations and four surface water sampling locations (Figure 5A & 5B). Sediment samples will also be collected at the surface water sampling locations. Samples will be analyzed through the Contract Laboratory Program for the thirty-one volatile priority pollutants (Appendix B).

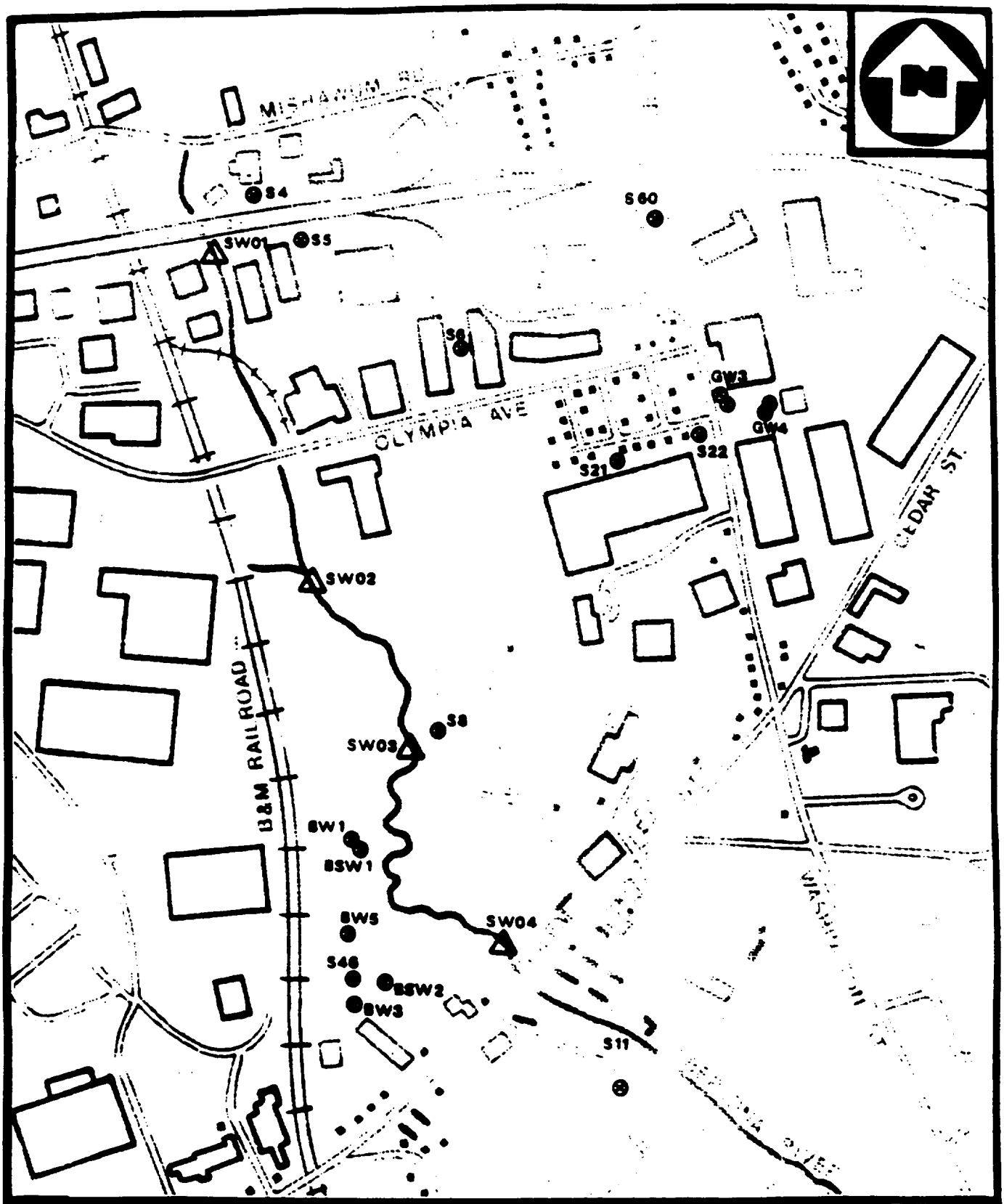
In addition, in-house screening on a Photovac gas chromatograph for volatile organics will be conducted on all samples. This screening data will provide qualitative information on a timely basis to aid in monitoring well placement.

Analytical information from this sampling round may modify groundwater montoring well locations. Any changes to well locations proposed in this scope of work will be discussed and approved by EPA. Groundwater, surface water and sediment sampling will adhere to the appropriate NUS Standard Operating Guidelines (Appendix D).

In addition to groundwater and surface water sampling, soil sampling will be conducted around sewer manholes suspected of experiencing periodic surcharging. Samples will be collected by hand augering and screened in-house for volatile organics. Manholes, which have experienced surcharging, will be identified by DEQE. If soil sampling around manholes produces a positive result, soil sampling (hand augering) will be conducted along some of the sewer lines in the study area (to be located later).

3.2 Phase II Activities

This section presents the scope of work for the field portion of the Remedial Investigation. Five major tasks are proposed as follows:



SAMPLING LOCATIONS

EAST WOBURN SITE

WOBURN, MASSACHUSETTS

MAY 1984

NUS CORPORATION

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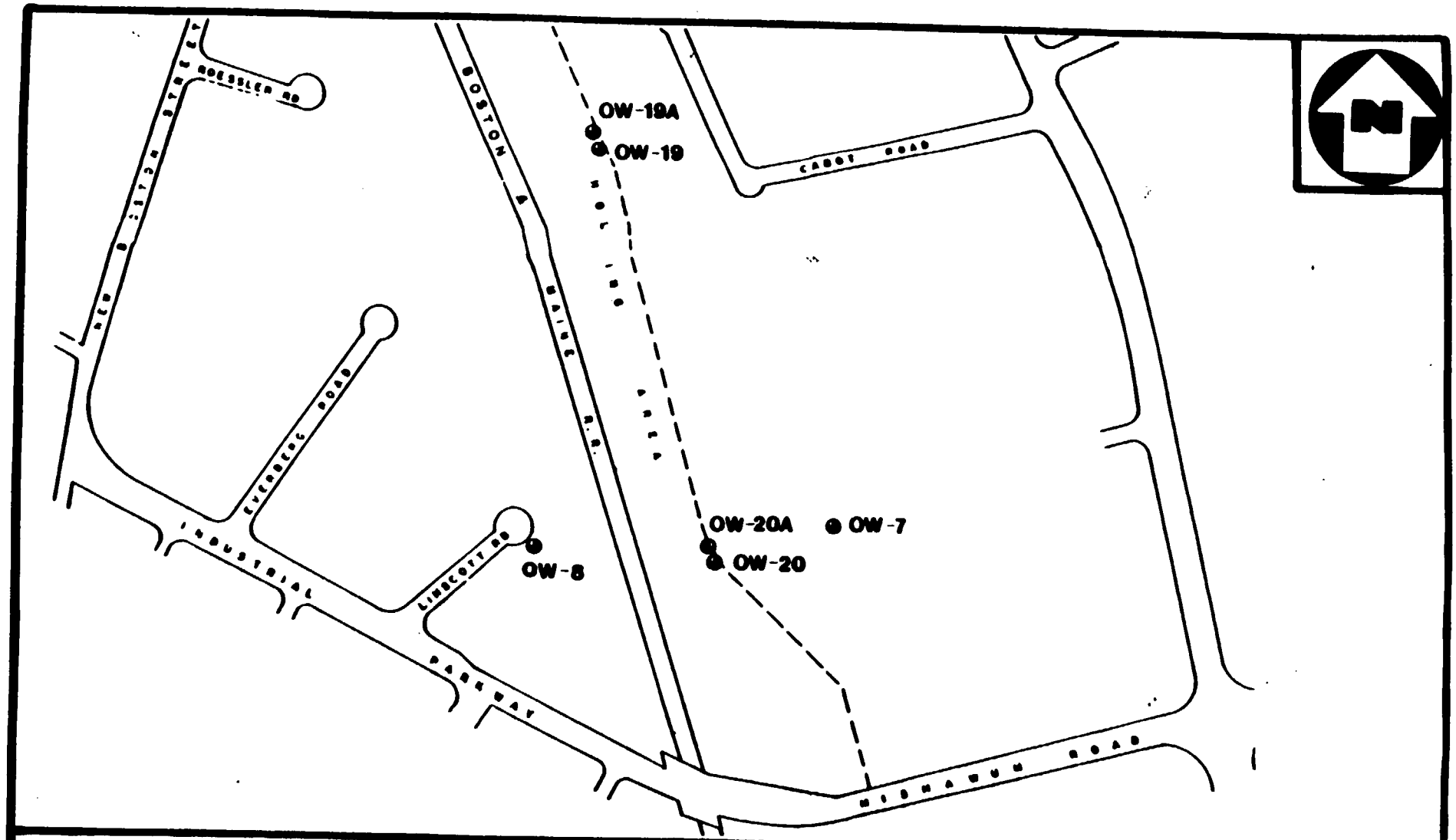
FIGURE 5A

BASE MAP DERIVED FROM U.S.G.S. LEXINGTON, BOSTON NORTH, READING & WILMINGTON QUADRANGLES 1971,1979 & 1980 AERIAL PHOTOGRAPHS OF EAST WOBURN, MA



ADDITIONAL SAMPLING LOCATIONS

NORTH OF STATE ROUTE 128

EAST WOBURN SITE
WOBURN, MASSACHUSETTS

MAY 1984

NUS CORPORATION
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FIGURE 5B

- Task 08: Installation of Groundwater Monitoring Wells
- Task 09: In-situ Permeability Testing/Grain Size Analysis
- Task 10: Final Sampling Rounds
- Task 11: Aquifer Test
- Task 12: Surveying

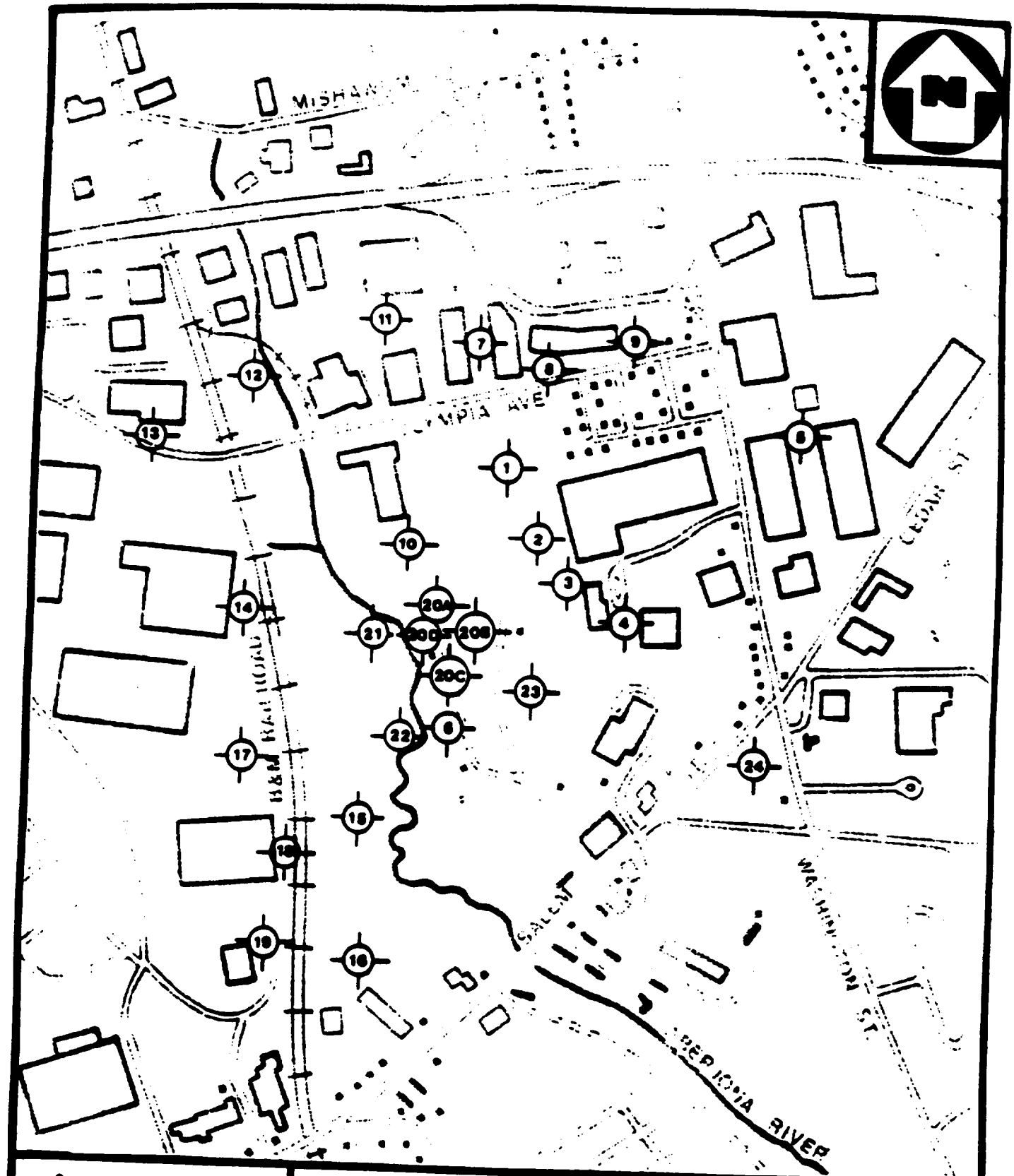
The field tasks have been planned to address the project objectives set forth in Section 1.2. Detailed task work plans for each task will be developed prior to the initiation of each field activity. Task work plans will address all relevant health and safety, quality assurance and technical requirements necessary to conduct the specified task. Task work plans will be subject to review and approval by EPA prior to initiation of work.

Task 08 Installation of Groundwater Monitoring Wells

The objectives of groundwater monitoring well installations are: to provide ground truthing for depth to bedrock and depth to groundwater; to provide surficial and bedrock geologic data for evaluation of groundwater movement in unconsolidated sediments and bedrock; provide data on vertical hydraulic gradients; provide data on vertical stratification of groundwater contamination; and to provide groundwater sampling locations for evaluation of drinking water quality and the extent of groundwater contamination.

The data will be used to describe the geohydrology of the Wells G & H aquifer area, to develop a geohydrologic data base sufficient to support subsequent remedial action feasibility study, to determine the need for and extent of remedial action, and to determine contaminant source areas.

The proposed groundwater monitoring well network is presented in Figure 6. Final well locations may change as data are obtained from the review of existing studies,



PROPOSED WELL LOCATIONS

EAST WOBURN SITE

WOBURN, MASSACHUSETTS

MAY 1984

NUS CORPORATION

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FIGURE 6

BASE MAP DERIVED FROM U.S.G.S. LEXINGTON, BOSTON NORTH, READING & WILMINGTON QUADRANGLES 1971,1979 & 1980 AERIAL PHOTOGRAPHS OF EAST WOBURN, MA

the initial sampling round and well installations. During monitoring well installations, daily progress will be discussed with EPA and DEQE and all changes will be reviewed and approved by EPA and DEQE.

Input from DEQE and EPA will be considered in determining the number, placement and construction of monitoring wells. In general, well construction will depend on OVA screening and the geologic strata encountered (Appendix D). Well screens will be placed in the geologic strata with the highest OVA readings and/or greatest permeability as predicted by visual grain size distribution. If a vertical distribution of volatile contamination is observed, well screens will be placed within each zone of contamination by means of nested wells. Criteria for determining what constituents different zones of contamination is detailed in Appendix D. Multi-level wells will also be installed to provide data concerning vertical hydraulic gradients.

After well installation and development, groundwater samples will be collected from each well for in-house screening on a Photovac gas chromatograph. Data from these samples will be used to decide if additional wells are needed in key areas as described below.

The remainder of this section describes the specific rationale for placement of each well location and possible well construction. The locations are discussed in the chronological order of installation.

- Well locations Nos. 1 to 4 - consists of nested multi-level wells. Each location will consist of a shallow bedrock well screened at least twenty feet into bedrock, an overburden well screened over the zone of the highest concentration of contamination (as determined by field screening techniques) and a shallow overburden well screened at the water table. Data from these wells will be used to determine vertical hydraulic gradients and vertical distribution of contamination. After well installation, the groundwater will be sampled from all wells and analyzed

on a Photovac gas chromatograph for volatile organics. If contamination is detected at location No. 4, one to two additional wells will be installed to the east and southeast. The data from these additional wells will be used to determine if contamination detected at well No. 4 is part of a plume of contamination emanating from a northeastern or eastern source area.

- Well location No. 5 and 6 - will consist of nested multi-level wells. Location No. 5 will consist of a well screened in overburden and shallow bedrock. If, after sampling the newly installed well, contamination is detected, then one to two additional wells will be placed further to the northeast and southwest. Data from these wells will be used to determine the lateral extent of contamination found at Wells S-21 and S-22 and to determine contaminant source areas. Location No. 6 will consist of overburden wells screened at the zone of highest concentration of contamination and at the water table. Data from these wells will be used to determine vertical hydraulic gradients and vertical distribution of contamination. Well No. 6 may also serve as the location of a 6" diameter pumping well (Task 11).

- Well locations Nos. 7, 8, and 9 - data collected from these wells along with the recently installed wells, IUS-1,2, and 3, will be used to describe the vertical and horizontal extent of the tetrachloroethylene contamination found at well S-6 and to identify the source area of that contamination. Well location No. 7 will consist of shallow bedrock well at the same location as the existing overburden well S-6. Well locations 8 and 9 will either consist of single overburden wells or nested multi-level wells depending on the sampling results from well location No. 7. If a vertical stratification of contamination is detected, nested multi-level wells at locations 8 and 9 may be necessary to describe the extent of contamination and identify the property from which the contamination is emanating.

- Well location No. 10 - This location will consist of nested multi-level wells likely screened in overburden and shallow bedrock, again dependent on the result of field screening techniques. This well location is upgradient of the Wells G & H aquifer area and downgradient from the former location of various small industries (Figure 1). The purpose of this well location is to determine whether there is a northern source area of contamination to the Wells G & H aquifer area.

- Well locations Nos. 11, 12, 13 and 14 - These locations are in areas upgradient of Wells G & H where few groundwater sampling points exist. Data from these wells plus existing wells north of I-95 will be used to determine upgradient water quality in support of the feasibility study and to determine whether there are northwestern source areas of contamination to the Wells G & H aquifer area. Any nested wells will further provide data on vertical hydraulic gradients.

  Well location No. 12 will also consist of a nested multi-level well. As stated, this construction will provide water quality data and data on vertical hydraulic gradients in support of the feasibility study. Field screening techniques will determine the construction of the wells at locations Nos. 11, 13 and 14. If an unidentified source area is indicated by field screening techniques during installation of wells at locations Nos. 11, 13, and 14, these wells will not by themselves identify the property from which the contamination emanates. Additional wells would be necessary; these additional wells would only be installed after consultation with EPA in order to determine priorities for and approval of any changes in direction of the Remedial Investigation.

- Well location Nos. 15 and 16 - will consist of shallow bedrock wells as pairs to the existing overburden wells Nos. BSW-1 and BSW-2. The data from these wells will be used to describe the vertical distribution of

contamination. They will also serve as water level measuring points during a aquifer test of Wells G & H (described further under Task 11).

- Well locations Nos. 17, 18 and 19 - will consist of wells located upgradient of Well No. S-46. The data collected from these wells will be used to locate any unidentified source areas of contamination and will also provide water quality data (in support of the feasibility study) in areas where none exists. The number and construction of wells at these locations will depend entirely on results of field screening techniques and subsequent groundwater sampling. Possible contingencies include nested multi-level wells and additional wells upgradient of these locations. Again, EPA will be informed daily of progress and will review and approve of all field decisions as to final location and construction of wells.

- Wells locations Nos. 20A-D - will be installed to provide water level measurement points for a aquifer test of Wells G & H in support of the feasibility study. The aquifer test will be further described under Task 11. Location No. 20 will consist of four wells located fifty feet north, south, east and west of the pumping well. Choice of a pumping well will also be discussed further under Task 11. These four wells will be single wells screened from the top of the water table to fifteen feet within the saturated zone. The data collected from these wells will be used to determine vertical hydraulic gradient, drawdown and recovery associated with the Wells G & H aquifer area during an aquifer test.

- Location Nos. 21 and 22 - will each consist of three nested multi-level wells screened at the following levels: the water table, at some depth in the saturated zone, and in shallow bedrock. These well locations will be placed as close to river as logistically possible. Data collected from these wells during the aquifer test will be used to establish the zone of influence associated with Wells G & H and to evaluate the hydraulic relationships between the Aberjona River and underlying aquifer.

- Well location No. 23 will consist of nested multi-level wells screened in the overburden and bedrock. This location will also provide data on vertical hydraulic gradients and rates and extent of drawdown and recovery during the pump test.

- Well location No. 24 will consist of a single well fully screened to intercept the water table and will provide data on the hydrologic boundaries associated with pumping of Wells G & H.

If permission and/or permits for a aquifer test are not obtained, as will be discussed under Task 11, then some of these final locations will be abandoned. However, location Nos. 21, 22, and 23 will still be installed because they also provide data as to the vertical distribution of contamination, vertical hydraulic gradients and sampling points where few previously existed.

A summary of well locations and the possible number of wells is presented in Table 1.

Task 09 In-situ Permeability Testing/Grain Size Analysis

The objective of conducting in-situ permeability testing and collecting samples for grain size analysis is to provide quantitative data on hydraulic conductivity of the major surficial units through which groundwater (and contamination) is migrating within the study area.

In-situ permeability tests will be performed on selected surficial geological units encountered beneath the site during the remedial investigation. Samples will be chosen based on geologic strata encountered and on OVA readings. This activity will help provide quantitative information on hydraulic conductivity (permeability) of each surficial unit. Location of permeability tests will be determined based on boring log data collected in the field so that permeabilities of the different materials may be estimated. Tests will likely be conducted at nested

Table 1

Summary of Well Locations

Well locations	Type	Number	Contingencies	Possible additional wells
1	nested multi-level	3		
2	nested multi-level	3		
3	nested multi-level	3		
4	nested multi-level	3	If contamination present	2
5	nested multi-level	2	If contamination present	2
6	nested multi-level	2		
7	bedrock	1		
8	overburden	1	If contamination found in bedrock	1
9	overburden	1	If contamination found in bedrock	1
10	nested multi-level	2	If contamination found	?
11	to be determined*	1	If contamination found	?
12	nested multi-level	2	If contamination found	?
13	nested multi-level	1	If contamination found	?
14	nested multi-level	1	If contamination found	?
15	bedrock	1		
16	bedrock	1		
17	to be determined	1	If contamination found	?
18	to be determined	1	If contamination found	?
19	to be determined	1	If contamination found	?
20A	screened at water table	1		
20B	screened at water table	1		
20C	screened at water table	1		
20D	screened at water table	1		
21	nested multi-level	3		
22	nested multi-level	3		
23	to be determined	2		
24	to be determined	1		
Total		44		6+

* To be determined based on field observations.

well locations after one well has been installed and the geologic strata have been identified. Either falling head or rising head tests along with recovery tests will be performed based on the particular geologic unit being addressed and on degree of saturation at the depth being evaluated. The tests will be conducted by the drilling contractors within the drilled borehole just prior to installation of the well. In addition to the in-situ permeability tests, grain size analyses will be performed on selected samples of material taken from the boring in the interval(s) being evaluated. The findings of these tests will be reviewed in light of the permeability test results. Details of the procedures will be included in the task work plan for groundwater monitoring well installation.

Task 10 Final Sampling Round

The objective of collecting groundwater and surface water samples are to provide drinking water quality data, to evaluate the physical extent (both horizontally and vertically) of groundwater contamination, to determine the chemical nature of groundwater contamination, to provide data to evaluate surface water quality, and to provide data to determine source areas of groundwater contamination.

Three final sampling rounds, a month apart from each other, will be conducted after the well installation task is completed. All newly installed wells will be sampled in addition to all sample locations from the initial sampling round. All groundwater samples will be analyzed for the thirty-one volatile priority pollutants plus tentative identification and quantitation of the next ten most abundant compounds by EPA method 624. An additional ten percent of the samples will be analyzed for all organic and inorganic priority pollutants.

Aqueous samples collected for inorganic analysis will be filtered to provide data on dissolved constituents. Dissolved concentrations of inorganic parameters will provide data on drinking water quality in support of the feasibility study. Sample locations for priority pollutant analysis will be chosen based on field screening results and/or areas where little information exists on water quality. This data will be used to determine the chemical nature and physical extent of groundwater contamination that currently limits the production of potable drinking water from Wells G & H.

In support of the feasibility study, the samples collected from the wells at location Nos. 11, 12, 14, 21, 23 and well Nos. S8 and S21 will also be analyzed for Federal Primary and Secondary Drinking Water Standards and the standards set by the Commonwealth of Massachusetts (Appendix C). The locations were selected to represent general groundwater quality in different areas and depths in the aquifer. The data obtained from these analyses will provide additional information on the aquifer water quality not attributed to volatile organic contamination. Review of historical data indicates that other water quality problems may exist and must be considered in determining the feasibility of aquifer treatment for volatile organics only. In addition, the concentration of certain parameters such as iron and manganese must be quantified in order to properly design any treatment facility. Groundwater and surface water and sediment sampling will be conducted according to the appropriate NUS Standard Operating Guideline. The technical approach, quality assurance requirements and health and safety considerations will be detailed in a task work plan. The general approach will follow that described in Appendix D.

Task 11 Aquifer Test

The objectives of the aquifer test are to provide data on: aquifer hydraulic conductivity, specific yield, zone of influence associated with pumping Wells G & H, and hydraulic connection between the Aberjona River and Wells G & H aquifer area. The data will be used to determine the method of groundwater treatment, design pumping capacities, operating life of the facility and ultimately the feasibility of this remedial option.

GCA's initial screening of remedial technologies for Wells G & H has determined that one likely remedial option will be groundwater treatment (well head treatment) and discharge. This option requires extensive data concerning aquifer characteristics such as concentration and spatial distribution for each contaminant of concern, and aquifer physical and hydraulic properties.

As previously discussed, well locations and sampling will be adequate to provide the necessary data on the concentration and spatial distribution of each contaminant of concern. Geologic classification of soils during well installations and in-situ permeability tests will provide additional data on the physical properties of the aquifer surrounding Wells G & H. However, an aquifer test will be necessary to provide the following data: aquifer hydraulic conductivity, specific yield, zone of influence associated with pumping Wells G & H, and hydraulic connection between the Aberjona River and the portion of the aquifer associated with Wells G & H.

The hydraulic relationship between the Aberjona River and Wells G & H was discussed in the Remedial Action Master Plan (RAMP) (3). The RAMP suggested that surface water quality could have impacted groundwater quality at Wells G & H under pumping conditions and vice versa under non-pumping conditions. The pump test is designed to establish whether there is a hydraulic connection.

Data collected during the pump test will be used to evaluate the effects of well head treatment on changes in concentration overtime at the treatment facility, downgradient receptors such as the Aberjona River, ponds, and other pumping wells, and migration behavior of upgradient sources of contamination.

GCA recommends a 48-hour pump test (at a pumping rate of 500-800 gallons/minute) to determine physical properties and hydraulic boundaries of Wells G & H. The 48-hour test is a preliminary estimation; a longer test may be required. The final design of the aquifer test will be described in the task work plan subject to approval by EPA and will follow in an addendum. GCA recommends the following data collection program:

1) <u>static water levels</u> - Prior to the initiation of a pump test, water level measurements should be obtained from all wells included in GCA's proposed monitoring network. Information obtained from the fully screened wells can be used to develop static water table contours; data obtained from the nested piezometers will be used to evaluate vertical gradients prior to the onset of pumping.

2) time-drawdown measurements - GCA suggests a non-equilibrium analysis of time-drawdown measurements in determining aquifer properties. This test should include a test well pumping at a specified constant rate, and the newly installed observation wells described in Section 3.2 (Task 07). This test requires early time-drawdown data. For observation wells situated close to the test well, water level measurements must be obtained at very close intervals during the first few hours. As the pump test progress, the interval between measurements increases until a change in drawdown is no longer evident at the observation well furthest from the test well. Measurements will also be made of the level of the river at gaging stations located upstream and downstream of the pumping well.

3) steady-state measurements - Based upon an estimate of the hydraulic conductivity for the stratified sands and gravel of the aquifer, GCA believes steady-state will be reached at those observation wells outlined above within the 48-hour test period. Prior to cessation of the pump test, water level measurements should be taken at all fully screened wells and nested piezometers of the monitoring network. Water table elevations measured at fully screened wells will be used in developing contour maps depicting the resulting cone of depression. The remaining water level data will be used to determine hydrologic boundaries and vertical gradients.

Once steady-state is reached during a pump test at a given discharge rate, hydrologic boundaries can be established. Observation wells situated relatively far from the test well will exhibit negligible drawdown. Such wells are indicative of the aquifers boundaries, because their piezometric head is not impacted by pumping.

4) recovery measurements - Finally, water level measurements during recovery of the aquifer to static conditions will provide additional data on hydraulic conductivity of the Wells G & H aquifer area.

The data collected during the pump test will also be used to determine hydrologic connections between the Wells G & H aquifer area and source areas of contamination. It will determine vertical gradients under pumping conditions and thus contaminant movement.

The minimum number of wells, in GCA's proposed aquifer test, to be used in defining the hydrologic influence of the Wells G & H are:

Well locations	20A, B, C, and D 2, 3, 10, and 15 21, 22, 23, and 24
Wells:	S8, S43

It is likely that more wells will be included to be specified in the task work plan. Choice of pumping well will be determined during Phase I of the Remedial Investigation. There are two alternatives: rehabilitate Well H or construct a new well. Well G has experienced a great amount of vandalism and NUS/FIT believes it would not be cost-effective to repair. A new well capable of pumping 150-300 gallon/minute would require a 6" diameter well casing, gravel packing and an adequate screen slot size to permit easy withdrawal of water. It would be screened from the top of the water table to a lower less permeable stratum. It is currently unknown whether it is feasible to bring Well H on line again. This determination will be made during Phase I of the Remedial Investigation.

A number of costs would be incurred in rehabilitating well H; these costs include:

- Determination of screen length.
- Examination of all mechanical equipment to determine if it is in working order.
- Examinaton and possible repair of all electrical equipment.

A final decision would be made after costs associated with rehabilitating Well H versus constructing a new 6" gravel packed well and purchasing or renting a pump that can draw 150-300 gallons/minute are determined.

Permission and/or permits to conduct an aquifer test will be procured during Phase I. Through discussions with EPA and DEQE, NUS/FIT believes the greatest obstacle to obtaining the necessary permits and/or permission will be the disposition of pumped water. There are two primary options: treatment with discharge to some downgradient point or discharge without treatment to some downgradient point. Treatment may be cost prohibitive and the right to discharge may be denied.

NUS will make every effort to see that these problems are resolved early in the study, as both NUS/FIT and GCA feel a pump test is critical to the Remedial Investigation.

Task 12 Surveying

Following the field activities, the locations and elevations of all new monitoring wells, sampling locations, and important existing monitoring wells will be surveyed and an updated basemap will be prepared. This map will serve as the basemap for the draft report. Prior to the aquifer test, the level of the Aberjona River will be surveyed and calibrated staff gages will be placed upstream and downstream of Well H. These measuring points will be used to determine whether pumping a well in the vicinity of Wells G & H has a draw down effect on the river.

3.3 Phase III Activities

Upon completion of all tasks and requirements for this investigation, a Draft Report will be prepared and submitted to the Region I EPA Site Manager and DEQE for review and comments. EPA and DEQE review and comments will be taken into consideration when preparing the final report.

The report will accomplish the following:

- describe the geohydrology of the Wells G & H aquifer area, including surface water and groundwater movement, and identify contaminant source areas and describe pathways and mechanisms of contaminant transport,

- present geohydrologic and chemical data sufficient to support a subsequent feasibility study which will determine the need for and extent of remedial action and will identify and evaluate the most cost-effective remedial actions for mitigating the effects of groundwater contamination at the Wells G & H aquifer area, and

- identify contaminant source areas and properties that are contributing contamination to the Wells G & H aquifer area, and collect information that is adequate to support successful future enforcement actions and source control remedial action.

4.0 REFERENCES

1. Ecology and Environment, Inc. Evaluation of the Hydrogeology of East and North Woburn, Massachusetts: Volume I. 25 June 1982. EPA Contract No. 68-01-6056, TDD No. F1-8109-02.

2. Ecology and Environment, Inc. Chlorinated Solvent Contamination of the Groundwater, East Central Woburn, Massachusetts. 8 March 1982. EPA Contract No. 68-01-6056, TDD No. F1-8203-01.

3. Camp Dresser & McKee, Inc. Draft Remedial Action Plan for East Woburn, Woburn Massachusetts. 21 January 1983. EPA Contract No. 68-03-1612, Work Assignment 2-1-12.

APPENDIX A

TECHNICAL DIRECTIVE DOCUMENTS F1-8311-06 AND F1-8405-02

1. LOST CENTER:

ACCOUNT NO.:

REM/FIT ZONE CONTRACT
TECHNICAL DIRECTIVE DOCUMENT (TDD)

2. NO. FI-8311-06

3. PRIORITY:
- [x] HIGH
- [ ] MEDIUM
- [ ] LOW

4. ESTIMATE OF TECHNICAL HOURS: 100

4A. ESTIMATE OF SUBCONTRACT COST: —

5. EPA SITE ID: MAD 980 732 168

5A. EPA SITE NAME: Woburn
Wells G & H

6. COMPLETION DATE: 12/15/83

7. REFERENCE INFO.:
- [ ] YES [ ] NO
- [ ] ATTACHED
- [ ] PICK UP

8. GENERAL TASK DESCRIPTION: Develop a Scope of Work for a hydrogeologic investigation of East Woburn. This investigation should be aimed at delineating the source or sources of contamination to Wells G & H.

9. SPECIFIC ELEMENTS: The Scope of Work should include but not be limited to the following:

Objective
Site Description
Well location & installation
Groundwater sampling
Analytical results
Recommendations

10. INTERIM DEADLINES:

11. DESIRED REPORT FORM: FORMAL REPORT [x] LETTER REPORT [ ] FORMAL BRIEFING [ ]

OTHER (SPECIFY):

12. COMMENTS: Coordinate with Dave Delaney

13. AUTHORIZING RPO: Donald R. Smith
(SIGNATURE)

14. DATE: 11-28-83

15. RECEIVED BY: Paul F. Clay
(CONTRACTOR RPM SIGNATURE)
[x] ACCEPTED [ ] ACCEPTED WITH EXCEPTIONS [ ] REJECTED

16. DATE: 11/29/83

Sheet 1 White – FITL Copy
Sheet 2 Canary – DPO Copy
Sheet 3 Pink – Contracting Officer's Copy (Washington, D. C.)
Sheet 4 Goldenrod – Project Officer's Copy (Washington, D. C.)

1 COST CENTER:	REM/FIT ZONE CONTRACT TECHNICAL DIRECTIVE DOCUMENT (TDD)	2. NO.
ACCOUNT NO.:		F1-8405-02

3. PRIORITY:	4. ESTIMATE OF TECHNICAL HOURS:	5. EPA SITE ID:	6. COMPLETION DATE:	7. REFERENCE INFO.:
[X] HIGH [ ] MEDIUM [ ] LOW	500	MAD 980-732-168		[ ] YES [X] NO [ ] ATTACHED [ ] PICK UP
	4A. ESTIMATE OF SUBCONTRACT COST: — — —	5A. EPA SITE NAME: Woburn Wells G + H	7-15-84	

8. GENERAL TASK DESCRIPTION: Develop a scope of work that will be used to direct a remedial investigation (RI) at the Woburn G + H wells. Begin Phase I activities.

9. SPECIFIC ELEMENTS:

The RI should support the feasibility study, identification of a responsible party (parties) and successful cost recovery enforcement action(s). Phase I activities include review of existing data, planning for site access, preparation of a base map, procurement of subcontractors, mobilization of equipment + performance of an initial round of environmental sampling.

10. INTERIM DEADLINES:

11 DESIRED REPORT FORM: FORMAL REPORT [X] LETTER REPORT [ ] FORMAL BRIEFING [ ]

OTHER (SPECIFY):

12. COMMENTS: Coordinate activities with Richard Leighton, EPA

13. AUTHORIZING RPO: Donald R. Smith (SIGNATURE)

14. DATE: 5-15-84

15. RECEIVED BY: [X] ACCEPTED [ ] ACCEPTED WITH EXCEPTIONS [ ] REJECTED

Richard G. DiNitto (CONTRACTOR RPM SIGNATURE)

16. DATE: 5-16-84

Sheet 1 White – FITL Copy
Sheet 2 Canary – DPO Copy
Sheet 3 Pink – Contracting Officer's Copy (Washington, D. C.)
Sheet 4 Goldenrod – Project Officer's Copy (Washington, D. C.)

APPENDIX B

LIST OF VOLATILE PRIORITY POLLUTANTS

VOLATILE COMPOUNDS

PP #	CAS #	
(2V)	107-02-8	acrolein
(3V)	107-13-1	acrylonitrile
(4V)	71-43-2	benzene
(6V)	56-23-5	carbon tetrachloride
(7V)	108-90-7	chlorobenzene
(10V)	107-06-2	1,2-dichloroethane
(11V)	71-55-6	1,1,1-trichloroethane
(12V)	75-34-3	1,1-dichloroethane
(13V)	79-00-5	1,1,2-trichloroethane
(14V)	79-34-5	1,1,2,2-tetrachloroethane
(15V)	75-00-3	chloroethane
(17V)	110-75-8	2-chloroethylvinyl ether
(23V)	67-66-3	chloroform
(27V)	75-35-4	1,1-dichloroethene
(28V)	156-60-5	trans-1,2-dichloroethene
(29V)	78-87-5	1,2-dichloropropane
(30V)	10061-02-6	trans-1,3-dichloropropene
(38V)	100-41-4	ethylbenzene
	10061-01-5	cis-1,3-dichloropropene
(86V)	75-09-2	methylene chloride
(87V)	78-87-5	chloromethane
(88V)	74-83-9	bromomethane
(89V)	75-25-2	bromoform
(90V)	75-27-4	bromodichloromethane
(91V)	75-69-4	fluorotrichloromethane
(92V)	75-71-8	dichlorodifluoromethane
(21V)	124-48-1	chlorodibromomethane
(32V)	127-18-4	tetrachloroethene
(86V)	108-88-3	toluene
(87V)	79-01-6	trichloroethene
(88V)	75-01-4	vinyl chloride

Non-Priority Pollutant Hazardous Substance List Compounds

VOLATILES

CAS #		ug/l or ug/kg (circle one)
67-64-1	acetone	
78-93-3	2-butanone	
75-15-0	carbon disulfide	
519-78-6	2-hexanone	
108-10-1	4-methyl-2-pentanone	
100-42-5	styrene	
108-05-4	vinyl acetate	
95-47-6	o-xylene	

APPENDIX C

LIST OF DRINKING WATER STANDARDS

FEDERAL DRINKING WATER STANDARDS FOR PUBLIC WATER SUPPLIES

Parameter

I. Inorganic

Primary Standards[1]	Maximum Contaminant Levels for Inorganic Chemicals (mg/l)
Arsenic	0.05
Barium	1
Cadmium	0.010
Chromium	0.05
Lead	0.05
Mercury	0.002
Nitrate as N	10.
Selenium	0.01
Silver	0.05
Fluoride	1.4 - 2.4[2]
Sodium	20.(5)

II. Organic

a)

Contaminant	Level (mg/l)
Endrin	0.0002
Lindane	0.0004
Methoxychlor	0.1
Toxaphene	0.005
2,4-D	0.1
2,4,5-TP Silvex	0.01

b) Total Trihalomethanes (TTHM)
TTHM = sum of the organohalogen compounds
MCL = 0.10 mg/l

Secondary Standards[3]	Recommended Maximum Contaminant Levels (mg/l)
Chloride	250
Color	15 color units
Copper	1.0
Corrosivity[4]	non-corrosive
Iron	0.3
Manganese	0.05
Odor	3 threshold odor number
pH	6.5-8.5 s.u.
Sulfate	250
Zinc	5.0
Total Dissolved Solids	500
Foaming agents	0.5

(1) 40 CFR Part 141 (Federal Register, Vol. 40, No. 248, December 24, 1975)

(2) Maximum allowable concentration depends on annual average of maximum daily air temperatures at site of supply.

(3) 40 CFR Part 143 (Federal Register, Vol. 44, No. 140, July 19, 1979)

(4) Requires Calcium Hardness Alkalinity, TDS.

(5) currently being considered

Massachusetts Requirements

- Demand, such as COD, BOD, TOC, chlorine residual.
- Pesticides, Herbicides, and other Organics, such as hydrocarbons, carbamates and organo-phosphorus compounds.
- Microbiological Analyses. this discipline shall be led into the following categories:

  (A) Total Coliform by the Membrane Filter Method.

  (B) Fecal Coliform by the Membrane Filter Method.

  (C) Total Coliform by the Fermentation Tube Method.

  (D) Fecal Coliform by the Fermentation Tube Method.

  (E) Standard Plate Count.

- Radiological Analyses.

Additional Requirements

- Chloroform - Trihalomethane formation potential
- Temperature

APPENDIX D

OVERVIEW OF STANDARD OPERATING GUIDELINES

CONTENTS

1.0 GROUNDWATER, JRFACE WATER AND SEDIMENT SAMPLING

Each well to be sampled will be purged a minimum of three well volumes to a maximum of five well volumes prior to sampling. Specific conductance and pH will be monitored following the purging of each well volume. Samples will be taken following the evacuation of at least three well volumes with the stabilization of pH and specific conductance. Conductivity and pH measurements should not exceed $\pm$ 0.03 pH units and $\pm$ 10% relative conductivity between successive measurements. Regardless of the allowed tolerances on pH and conductivty, static water purging will not exceed five well volumes. The wells will be purged by pumping or hand bailing. Each well sample will be collected from clean stainless steel/teflon bailer after purging is complete and the water level has risen to at least 75% of its greatest drawdown.

Water level measurements will be taken prior to sample collection, periodically during purging and periodically after sampling as the water level returns to static conditions. Collected samples will immediately be labelled and packed in ice prior for removal from the site.

Health and safety requirements will be detailed in a task work plan. Sampling activities will likely require protective clothing (tyveks, inner disposable gloves, outer nitrile gloves, neoprene boots) and use of general decontamination procedures. Periodic ambient air monitoring during well purging will dictate respiratory protection. Careful attention will be paid to the decontamination of purging and sample collection equipment to prevent cross contamination between wells.

Surface water samples will be collected by submerging sample bottles directly into the water. Sediment samples will be collected with a remote stainless steel sampling device. Quality control samples, duplicates and blanks, will be incorporated into the sampling plan.

An additional 44 ml glass vial of each sample will be collected for in-house screening on the Photovac gas chromatograph. Chain of Custody and preservation methods will adhere to the appropriate NUS Standard Operating Guidelines (not discussed here).

2.0 GROUNDWATER MONITORING WELL INSTALLATIONS

Drilling and well installation work to be performed will be subcontracted and will adhere to NUS and EPA approved task work plan specifications.

Drilling will utilize hollow-stem auger or drive casing of hardened steel with a minimum four inch inside diameter. Soil samples will be collected with a 24-inch long, two-inch outside diameter (O.D.) split-spoon sampler at five foot intervals. The split-spoon sampler will be driven with a 140 pound drive weight falling thirty inches. The driving resistance (blow counts) will be recorded for each six inches (6") the sampler is driven. A representative soil sample will be recovered from the sampler with a stainless steel trowel and stored in at least one wide-mouthed eight ounce glass jar for geologic characterization. In addition, one 44ml septum sealed glass vial will be partially filled with soil for OVA headspace analysis. When obstructions cause less than twelve inches (12") per 100 blows, or less than one inch (1") per 50 blows of a standard split-spoon sampler when driven with a 140 pound weight free-falling thirty inches (30"), the driller will attempt to penetrate the obstruction by the use of a roller bit (in dense material) or by coring (for boulders). If the obstruction can not be penetrated, the original location may be abandoned and a new well location will be chosen by the NUS field geologist.

The monitoring well casing will consist of Schedule 80, threaded flush-joint PVC with a nominal pipe size of one and one-half inches inside diameter (1.5" ID).

The screened portion of the casing will consist of slotted PVC with a slot size of not less than 0.010 inches and will have a minimum length of ten feet.

Because split spoon soil samples will be collected at five foot intervals, a ten foot minimum for the well screen is necessary to intercept a zone of contamination detected by OVA field screening.

In shallow bedrock monitoring wells, a minimum of twenty feet (20') will be cored using standard ASTM methods for diamond core drilling. A minimum of twenty feet of bedrock coring was selected because data from previous studies indicated that ten feet of bedrock coring was inadequate to intercept the full zone of surficial bedrock fracturing.

Installation of deep bedrock wells is not anticipated in this study.

For shallow overburden wells, the annular space between the well casing and overburden shall be backfilled with a 60/40 Ottawa sand, or similarly graded sand, to a level approximately one foot (1') above the top of the screen, which will be followed by two foot (2') bentonite seal. For deeper overburden wells, the same procedure will be followed except the Ottawa sand backfill will be followed by a ten foot (10') injected bentonite slurry seal (using a 3:1 ratio of bentonite to cement). The amount of Ottawa sand needed to adequately cover screens will be calculated and then measured as it is installed. Backfill will be placed in the annulus so that a minimum of one inch (1") of backfill material is between the casing and the natural overburden material.

For wells screened in shallow bedrock, the annular space between the well casing and bedrock shall be backfilled, with the same material used in overburden wells, to a level approximately four feet (4') below the bedrock surface or one foot (1') above the top of the well screen. The Ottawa sand backfill will be followed by a ten foot (10') injected bentonite slurry seal (using a 3:1 ratio of bentonite to cement).

To provide well security, a six inch (6") diameter black steel casing five feet (5') in length painted with a rust preventative paint shall be placed around the PVC casing and set into a two foot (2') depth of concrete grout. The top of the steel casing shall extend above the inner casing to allow for ease of access, and shall be threaded and fitted with a cap with a 1/4" side vent hole. A hardened steel clasp

shall be welded on one side of each steel casing so that the cap may be secured with a hardened steel lock. The lock identification number will be scratched off. All security casing and caps must be free of all oil or solvents.

Placement of groundwater monitoring well screens will be determined in the field based on the stratigraphy encountered and the vertical distribution of volatile organic compounds (as determined by field and in-house screening).

Organic vapor concentrations will be determined with a Century Systems Organic Vapor Analyzer (OVA) 128. Headspace analysis will be performed on soil and drilling wash water samples collected during well installation. Injection of headspace vapors will be made with a gas tight syringe onto an OVA G-24 column. Two modes of operation will be utilized: total organic vapors and gas chromatography. If the initial screen of total organic vapors gives a positive result, a chromatogram will be run and recorded on a strip chart recorder. Organic vapor measurements will be made in the field during drilling and will be part of the health and safety procedures and corresponding action levels. Further detail of the OVA procedure will be provided in a complete operating guideline package at a later date. Whenever possible, soil, groundwater and drilling wash water samples will be collected for volatile headspace analysis on a Photovac gas chromatograph located at EPA-Lexington. Due to its greater sensitivity, this analysis will provide additional data on which to base field decisions.

In those locations where a vertical stratification of organic contamination is apparent, multi-level wells will be installed. Multi-level wells will consist of a cluster of wells screened at appropriate intervals.

Stratification of organic contamination will be defined as the presence of contamination as detected by OVA field screening techniques in zones at least twenty feet apart. Contamination detected in soils less than twenty feet apart (i.e. in split spoon samples ten feet apart) will not necessarily indicate different plumes contamination but rather the same plume of contamination unevenly distributed in the overburden according to the variation in permeability of the

materials encountered. Multi-level wells will also be installed in areas where data concerning vertical hydraulic gradients is needed and will consist of two, three or more individual wells depending on geologic strata encountered, field screening results and study objectives.

After well installation, the drillers will be required to develop the well by purging the well until clear silt-free water is obtained or until recharge is insufficient to continue pumping. Following development and well recovery, the groundwater will be sampled the following day for in-house screening on a photovac gas chromatograph. The screening results will be used to decide whether additional wells need to be installed in key areas as detailed in Section 3.2 (Task 08).

It is anticipated that two drilling rigs will be employed simultaneously to complete the installation of groundwater monitoring within a reasonable time frame. Therefore, the NUS field team will consist of two on-site geologists, each supervising one of the drilling rigs. They will be responsible for collecting and logging split spoon soil samples and overseeing all aspects of well installation. The on-site geologist will also collect soil, drilling wash water and groundwater samples for OVA screening.

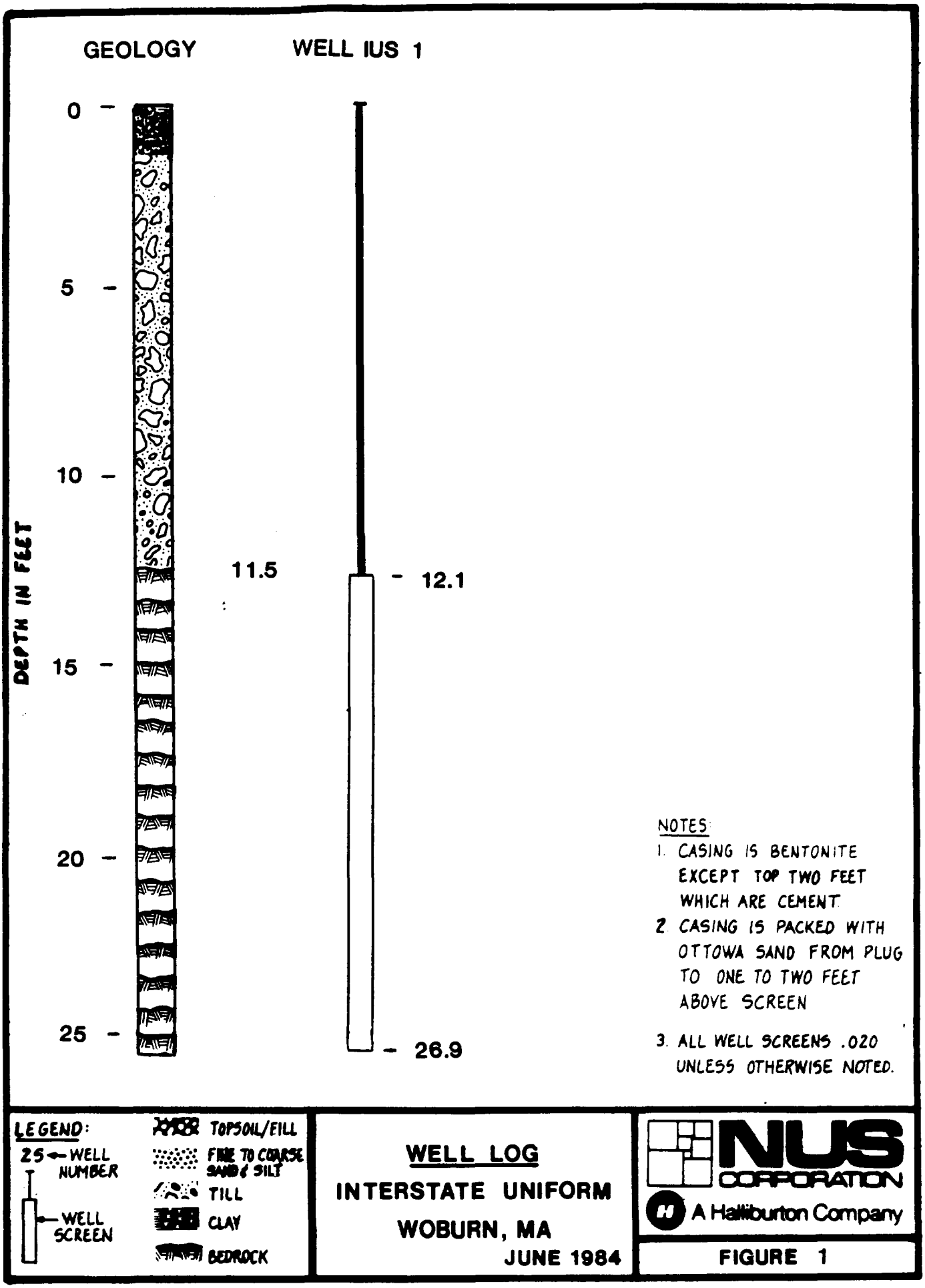
An on-site chemist will locate an OVA screening station at a central location to both drilling rigs. The chemist will be responsible for conducting headspace volatile analysis on all samples collected by the on-site geologists. All split spoon soil samples will be screened for volatile contaminants. Additional samples will be screened at the discretion of the supervising geologist. The on-site chemist will also be responsible for ambient air monitoring for health and safety concerns. An additional field technician will be responsible for groundwater sampling after well installation and assisting the rest of the work crew.

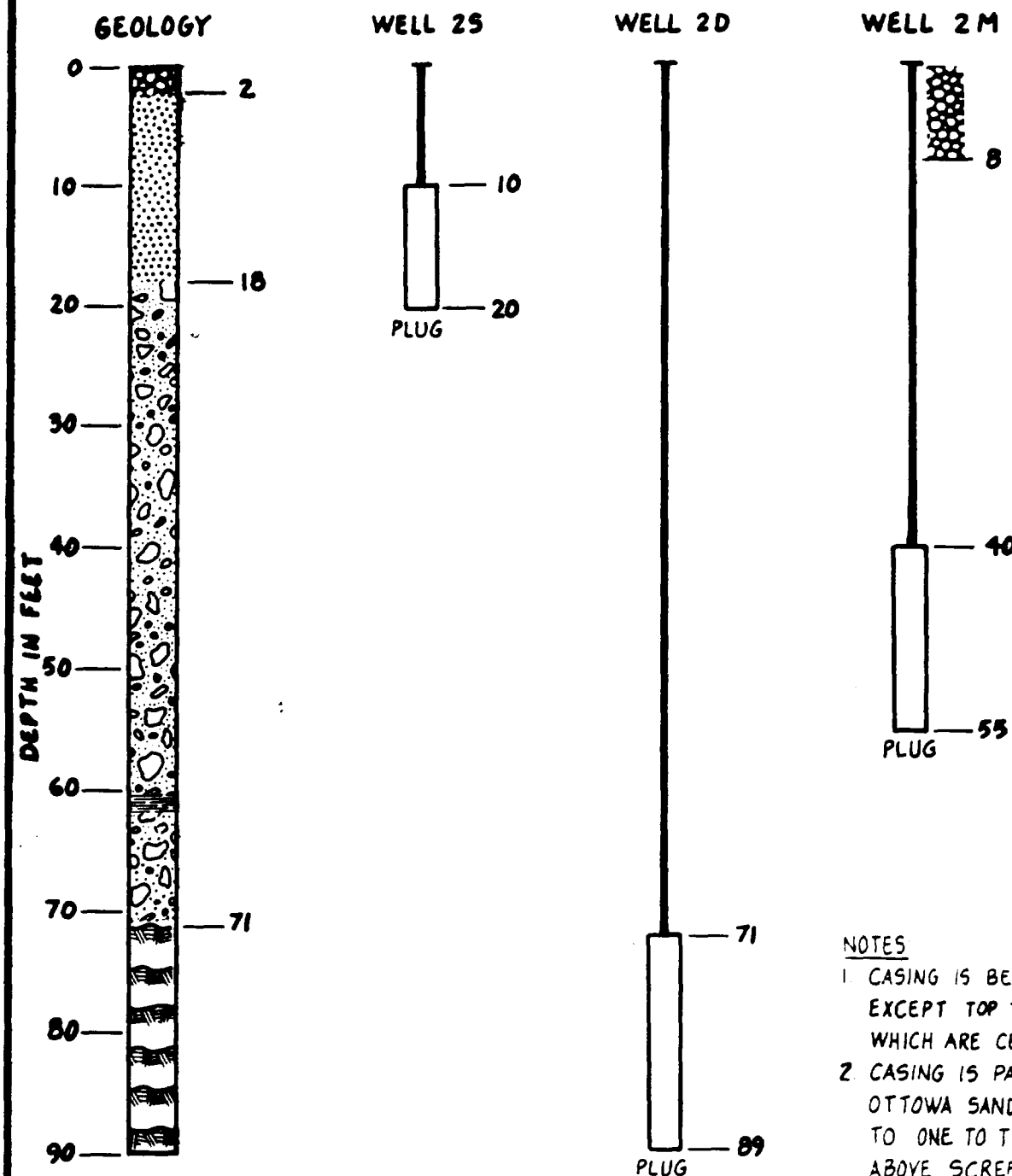
Protective clothing during groundwater well installations will typically include hard hats, neoprene boots, tyveks, inner disposable gloves and outer nitrile gloves. The results of ambient monitoring and OVA headspace analysis will dictate respiratory protection and the need for butyl rubber aprons or other protective equipment.

APPENDIX B
WELL LOGS FOR NON-NUS/FIT WELLS

This appendix contains logs for wells and test borings located in the Wells G & H Remedial Investigation Study area which were installed by other companies than NUS/FIT. The well logs are presented in the following order;

Section	Site	Installed by
1.0	UniFirst Corporation	Environmental Research and Technology, Inc.
2.0	W.R. Grace	Con-Tec., Inc.
3.0	Wildwood Conservation Corporation	Woodward-Clyde Consultants
4.0	Wildwood Conservation Corporation	Weston Geophysical
5.0	East Woburn	Ecology and Environment, Inc.
6.0	Wells G & H Aquifer Test	Atlantic Testing Laboratories, Limited

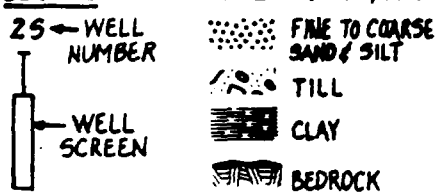

GEOLOGY
WELL IUS 1
0
5
10
15
20
25
DEPTH IN FEET
11.5
12.1
26.9
NOTES:
1. CASING IS BENTONITE EXCEPT TOP TWO FEET WHICH ARE CEMENT
2. CASING IS PACKED WITH OTTOWA SAND FROM PLUG TO ONE TO TWO FEET ABOVE SCREEN
3. ALL WELL SCREENS .020 UNLESS OTHERWISE NOTED.
LEGEND:
25 ← WELL NUMBER
WELL SCREEN
TOPSOIL/FILL
FINE TO COURSE SAND & SILT
TILL
CLAY
BEDROCK
WELL LOG
INTERSTATE UNIFORM
WOBURN, MA
JUNE 1984
NUS CORPORATION
A Halliburton Company
FIGURE 1



NOTES

1. CASING IS BENTONITE EXCEPT TOP TWO FEET WHICH ARE CEMENT
2. CASING IS PACKED WITH OTTOWA SAND FROM PLUG TO ONE TO TWO FEET ABOVE SCREEN
3. ALL WELL SCREENS .020 UNLESS OTHERWISE NOTED.

LEGEND:



WELL LOG

INTERSTATE UNIFORM

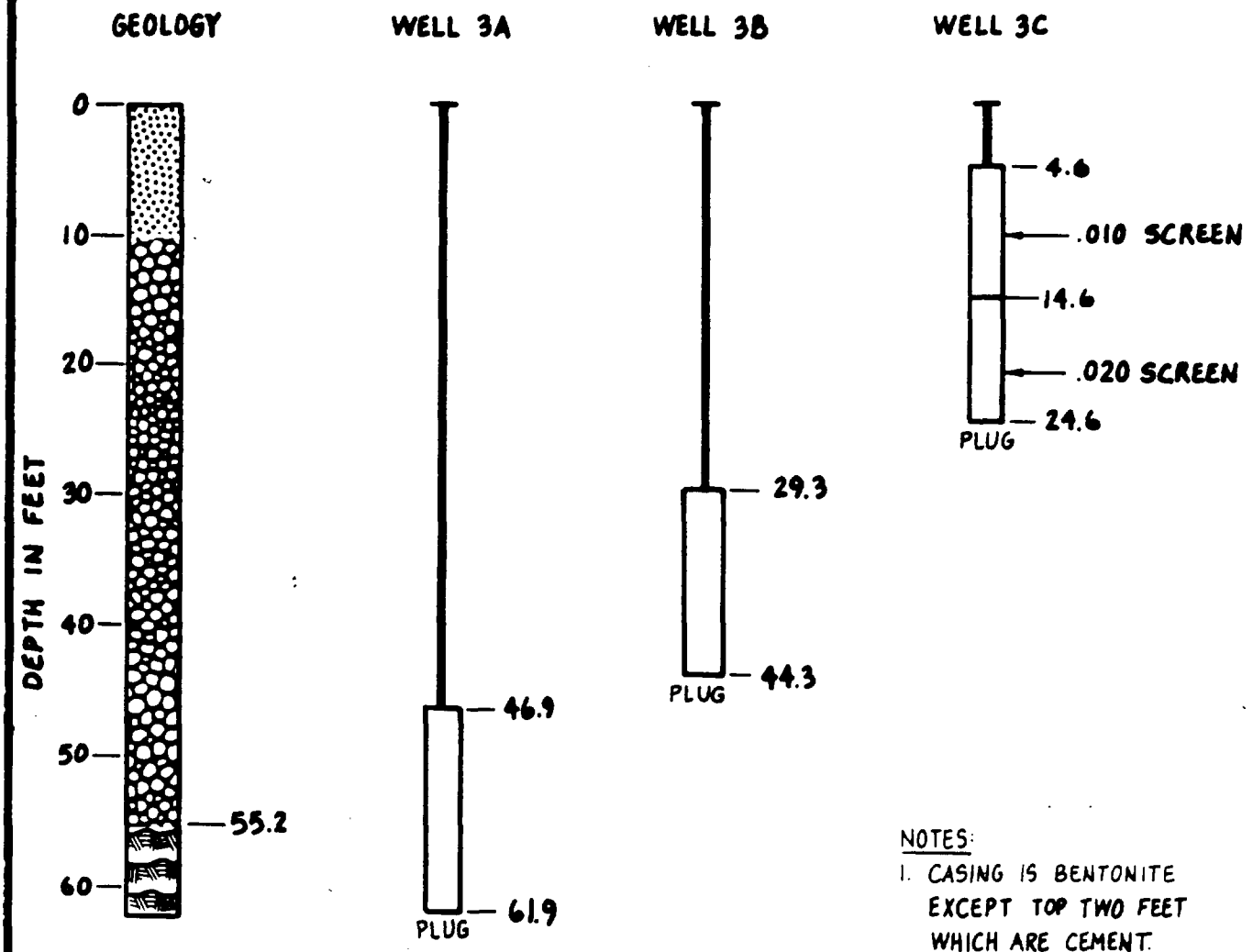
WOBURN, MA

JUNE 1984

NUS CORPORATION

A Halliburton Company

FIGURE 2



NOTES:

1. CASING IS BENTONITE EXCEPT TOP TWO FEET WHICH ARE CEMENT.
2. CASING IS PACKED WITH OTTOWA SAND FROM PLUG TO ONE TO TWO FEET ABOVE SCREEN.
3. ALL WELL SCREENS .020 UNLESS OTHERWISE NOTED.

LEGEND:

25 ← WELL NUMBER

← WELL SCREEN

FINE TO COARSE SAND & SILT

TILL

BEDROCK

WELL LOG

INTERSTATE UNIFORM

WOBURN, MA

JUNE 1984

NUS CORPORATION

A Halliburton Company

FIGURE 3

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO.-CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G1S

DATE STARTED 6/22/83 COMPLETED 6/22/83 SURF. ELEV.

GROUND WATER JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 36.5'
					36.5'
					BOTTOM OF BORING 36.5'
					NOTE: Installed 39.3' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO- CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G1D

DATE STARTED 6/13/83 COMPLETED 6/17/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" and 3" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					TOPSOIL .6'
5.0'		8-13	1	5'-7'	Light brown, moist, medium-dense, fine to medium SAND and fine to coarse GRAVEL, trace silt 7.0'
		14-15			
		15-13	2	'7-9'	Olive-brown, moist, dense to very dense SILT, some embedded fine to coarse gravel, cobbles, little embedded fine to coarse sand
10.0'		13-14			
		21-30	3	11'-13'	
		32-37			
		31-36	4	13'-15'	
15.0'		45-54			
		15-36	5	17'-19'	
20.0'		65-79			
25.0'		5-9	6	24'-26'	25.0'
		33-45			Light brown, wet, very dense, medium to fine SAND, some fine to coarse gravel, little silt
30.0'					TOP OF ROCK @ 34.5'
					Run - 1 34.5' - 37.0'. RQD = 0
35.0'					Recovery 1.0' - 40%
					Weathered broken ROCK 37.0'
40.0'					NOTE: Set 3" casing to 36.0'

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W. R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WOBURN, MA.

HOLE NO. G1D

DATE STARTED 6/13/83 COMPLETED 6/17/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" AND 3" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
45.0'					Drilled with roller bit to 37.0' Run - 2 37' - 43' RQD = 35% Recovery 4.9' - 82% Broken pink-green-gray GRANODIORITE 43.0'
50.0'					Run - 3 43' - 47' Recovery 4.3' - 107% Broken pink-green-gray GRANODIORITE 47.0'
55.0'					Run - 4 47' - 51.5' RQD = 24% Recovery 3.6' - 80% Broken pink-green-gray GRANODIORITE 51.5'
					BOTTOM OF BORING 51.5'

NOTE:
1. Core size = NX
2. Coring time in rock 5-6 min./ft; no water loss.
3. Installed 52.5' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO.-CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G2S

DATE STARTED 6/14/83 COMPLETED 6/14/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 19' 19.0'
					BOTTOM OF BORING 19.0'
					NOTE: Installed 20.6' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W. R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G2M

DATE STARTED 6/14/83 **COMPLETED** 6/14/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING

SHEET 1 **OF** 1

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 28'
					28.0'
					BOTTOM OF BORING 28.0'
					NOTE: Installed 29.4' of 2" PVC riser pipe in borehole; bottom 5' section is slotted.

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G2D

DATE STARTED 6/10/83 **COMPLETED** 6/14/83

SURF. ELEV.

GROUND WATER 6/13 - 7a.m. - 7'

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 8" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" AND 3" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		3-4	1	0-2'	TOPSOIL .2'
		5-4			
		4-12	2	2'-4'	Brown, dry, loose to dense, fine to coarse SAND, fine to coarse GRAVEL, COBBLES, BOULDERS little silt 4.0'
		13-16			
5.0'		23-23	3	4'-6'	
		25-40			Light brown, dry, dense to very dense, coarse to fine SAND and fine to coarse GRAVEL 10.0'
		16-37	4	6'-8'	
		35-27			
		13-14	5	8'-10'	
10.0'		10-12			
		8-10	6A	10'-11.5'	Light brown, wet, medium-dense, fine to medium SAND, little fine to medium gravel, trace silt 11.5'
		10-12	6B	11.5'-12'	
		11-18	7A	12'-13'	
		14-16	7B	13'-14'	
15.0'		8-10	8	14'-16'	Light brown, wet, medium-dense, medium to fine SAND and medium to fine GRAVEL 18.5'
		11-10			
		10-11	9	16'-18'	Light brown, wet, dense to very dense SILT, fine SAND and embedded fine to coarse GRAVEL 21.5'
		7-15			
		14-21	10	18'-20'	
20.0'		23-21			
		21-33	11	20'-22'	Light gray-brown, moist, very dense SILT, some embedded fine to coarse gravel, trace embedded fine to medium sand 24.0'
		31-37			
					Olive-brown, wet, stiff CLAY, little embedded fine to coarse gravel, cobbles
25.0'					Top of Rock @ 29.0'
		6-5	12	25'-27'	Drilled with rock bit to 29.5'
		6-6			Run - 1 29.5' - 34.5' RQD = 87%
					Recovery 4.6' - 92%
30.0'					Gray-green GRANODIORITE with quartz stringers 34.5'
					Run - 2 34.5' - 39.5' RQD = 100%
					Recovery 5.0' - 100%
35.0'					Gray-green GRANODIORITE with quart stringers 39.5'
40.0'					

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISON

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G2D

DATE STARTED 6/10/83 COMPLETED 6/14/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 2 OF 2

BORING MADE WITH 4" AND 3" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
45.0'					Run - 3 39.5' - 44.5' RQD = 97% Recovery 4.8' - 96% Gray-green GRANODIORITE with quartz stringers 44.5'
50.0'					Run - 4 44.5' - 49.5' RQD = 100% Recovery 4.3' - 86% Gray-green GRANODIORITE with quartz stringers 49.5'
					BOTTOM OF BORING 49.5' NOTE: 1. Core size = NX 2. Coring time in rock 3-4 min/ft; no water loss. 3. Installed 49.9' of 2" PVC riser pipe in borehole: bottom 15' section is slotted.

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G3S

DATE STARTED 6/21/83 COMPLETED 6/22/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 37' 37.0'
					BOTTOM OF BORING 37.0'
					NOTE: Installed 39' of 2" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G3D

DATE STARTED 6/17/83 COMPLETED 6/21/83

SURF. ELEV.

GROUND WATER 6/21 - 7a.m. - 18.5' CASING @ 39.3'
HOLE @ 56.4'

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" and 3" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		4-3	1	0-2'	TOPSOIL .5'
		6-7			
		3-3	2A	2'-3'	Brown, dry, loose, fine to coarse SAND, little silt, little fine to medium gravel, trace ashes 4.0'
		4-21	2B	3'-4'	
5.0'		22-52	3	4'-5'	
					Brown, dry, very dense, fine to coarse GRAVEL, some fine to coarse sand 10.5'
		31-33	4	6'-7.5'	
		49			
		51	5	8'-8.5'	
10.0'					
		25-50	6A	10'-11.3'	Olive-gray, moist, very dense SILT, little fine to coarse sand, little fine to coarse gravel 14.0'
		64/.3			
15.0'					
		20-21	7A	15'-16'	Yellow-gray, dry, dense, fine to coarse SAND, little fine to medium gravel 19.0'
		19-21	7B	16'-17'	
		9-26	8	17'-19'	
		38-56			
20.0'		73-50	9A	19'-19.5'	
		46			Light brown, wet, very dense, fine to medium SAND, SILT and fine to coarse GRAVEL 24.0'
25.0'					
		12-10	10	25'-27'	Light brown, wet, medium-dense, coarse to fine SAND and SILT 30.0'
		9-8			
30.0'					
		25	11	30.5'-31'	Olive-brown, wet, very dense, fine to medium SAND, fine to coarse GRAVEL, COBBLES, BOULDERS, little silt
		25/00			TOP OF ROCK @ 38.6'
35.0'					
		71/.3	12	35.4'-35.7'	Drilled with rock bit to 39.3'
40.0'					

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G3D

DATE STARTED 6/17/83 COMPLETED 6/21/83

SURF. ELEV.

GROUND WATER SEE PAGE 1

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Run - 1 39.3' - 44.3' RQD = 90%
					Recovery 4.9' - 98%
45.0'					Gray-green GRANODIORITE 44.3'
					Run - 2 44.3' - 49.3' RQD = 75%
					Recovery 4.0' - 80%
50.0'					Gray-green GRANODIORITE 49.3'
					Run - 3 49.3' - 53.2' RQD = 128%
					Recovery 4.4' - 113%
55.0'					Gray-green GRANODIORITE 53.2'
					Run - 4 53.2' - 56.4' RQD = 97%
					Recovery 3.7' - 116%
60.0'					Gray-green GRANODIORITE 56.3'
					Run - 5 56.4' - 61.4' RQD = 97%
					Recovery 4.9' - 98%
65.0'					Gray-green GRANODIORITE 61.4'
					BOTTOM OF BORING 61.4'

NOTE:

1. Core size = NX
2. Coring time in rock - 5 min/ft.; no water loss.
3. Installed 63.6' of 2" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-3DB

DATE STARTED 8/28/84 COMPLETED

SURF. ELEV.

GROUND WATER 8/29 - CASING @ 31'; HOLE @ 36' - 18.9'
9/4 - CASING @ 36'; HOLE @ 89.5' - 21'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" & 3" CASING; NQ WIRE LINE CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
30.0'					Drilled without sampling to top of rock
35.0'					TOP OF ROCK 32.0'
40.0'					Drilled with roller bit from 32' to 36' Set 3" casing to 36' 36.0'
45.0'					Run - 1 36' - 37.4' RQD - 0 Recovery 1.1' - 79% Light gray, medium grained GRANODIORITE 37.4'
50.0'					Drilled with roller bit to 38.0'
55.0'					Run - 2 38' - 44' RQD - 75% Recovery 5.9' - 98% Light gray, medium grained GRANODIORITE 44.0'
60.0'					Run - 3 44' - 53.8' RQD - 82% Recovery 9.7' - 99% Light gray, medium grained GRANODIORITE 53.8'
65.0'					Run - 4 53.8' - 63.5' RQD - 91% Recovery 9.0' - 93% Light gray, medium grained GRANODIORITE 63.5'

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-3DB

DATE STARTED 8/28/84 COMPLETED

SURF. ELEV.

GROUND WATER 9/6 - CASING @ 36'; HOLE @ 100'-19.8'
9/7 - 20.5'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

NQ WIRE LINE CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
70.0'					Run - 5 63.5'-69.0' RQD - 100% Recovery 5.5'-100% Light gray, medium grained GRANODIORITE with quartz and pink feldspar stringers 69.0'
75.0'					Run - 6 69.0'-74.0' RQD - 100% Recovery 5.7'-114% Light gray, medium grained GRANODIORITE with quartz and pink feldspar stringers 74.0'
80.0'					Run - 7 74.0'-80.2' RQD - 32% Recovery 6.2'-100% Light gray, broken, medium grained GRANODIORITE 80.2'
85.0'					Run - 8 80.2'-88.5' RQD - 25% Recovery 8.3'-100% Light gray, broken, medium grained GRANODIORITE with quartz and pink feldspar stringers 88.5'
90.0'					Run - 9 88.5'-94.0' RQD - 85% Recovery 5.2'-95% Light gray, broken, medium grained GRANODIORITE with quartz and pink feldspar stringers 94.0'
95.0'					Run - 10 94.0'-100.0' RQD - 89% Recovery 5.5'-92% Light gray, broken, medium grained GRANODIORITE with quartz and pink feldspar stringers 100.0'
100.0'					BOTTOM OF BORING 100.0'

TEST BORING LOG

CON–TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-3DB

DATE STARTED 8/28/84 COMPLETED

SURF. ELEV.

GROUND WATER See pg. 1 & 2

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Notes: 1. Coring time in rock averaged 3 to 6 min/ft.; losing some water in fractures at 55'. 2. Installed 96' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

CON-TEC., INC.
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603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G4S

DATE STARTED 6/9/83 COMPLETED 6/9/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 26'
					26.0'
					BOTTOM OF BORING 26.0'
					NOTE: Installed 26.5' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBRUN, MA.

HOLE NO. G4D

DATE STARTED 6/7/83 COMPLETED 6/9/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		3-15	1	0-2'	Brown, dry, medium-dense to very dense, fine to medium SAND, SILT and coarse to fine GRAVEL, COBBLES, BOULDERS
		13-20			
		15-41	2	2'-3.5'	
		200			
5.0'					
					7.5'
10.0'		23	3	9.5'-11.5'	Light brown, wet, very dense, fine SAND, some embedded fine to coarse gravel, little silt
		30-30			
		50-100	4	11.5'-13.5'	
		110-77			
		34-90	5	13.5'-15.5'	
15.0'		51-60			
		63-81	6	15.5'-17.5'	
		150-100			
		56			
20.0'					
		27-35	7	20'-22'	
		103-61			
25.0'		21-100/0	8	24'-24.5'	Gray-brown, wet, dense, coarse to fine SAND and fine to medium GRAVEL, trace silt
					TOP OF ROCK @ 24.5'
					Run - 1 24.5' - 29.5' RQD = 40%
					Recovery 4.2' - 84%
					Gray-green GRANODIORITE 29.5'
					Run - 2 29.5' - 34.5' RQD = 63%
30.0'					Recovery 4.2' - 84%
					Gray-green GRANODIORITE 34.5'
					Run - 3 34.5' - 39.5' RQD = 87%
					Recovery 5.0' - 100%
35.0'					Gray-green GRANODIORITE 39.5'
40.0'					

TEST BORING LOG

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603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G4D

DATE STARTED 6/7/83 **COMPLETED** 6/9/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
45.0'					Run - 4 39.5' - 44.5' RQD = 88% Recovery 5.3' - 106% Gray-green GRANODIORITE 44.5' BOTTOM OF BORING 44.5' NOTE: 1. Core size = NX 2. Coring time in rock 8-10 min/ft; no water loss. 3. Installed 45' of 2" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G5S

DATE STARTED 6/23/83 COMPLETED 6/23/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 21' 21.0'
					BOTTOM OF BORING 21.0'
					NOTE: Installed 24.3' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST, WOBURN, MA.

HOLE NO. GSD

DATE STARTED 6/9/83 **COMPLETED** 6/9/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Brown, dry, SAND, SILT, GRAVEL, COBBLES and BOULDERS 4.0'
5.0'		10	1	4.5'-6.5'	Olive-brown, wet, medium-dense, fine to medium SAND, some silt, little embedded fine to medium gravel
		10-10			
		9-9	2	6.5'-8.5'	
		8-6			
		4-8	3	8.5'-10.5'	
10.0'		10-12			
		8-5	4	10.5'-12.5'	
		4-15			
		67-8	5	12.5'-14.5'	
		12-17			
15.0'		43-21	6	14.5'-16.5'	
		27-27			
		32=12	7	16.5'-18.5'	
		8-12			
		12-100	8	18.5'-19'	
20.0'		64-50/0	9	19'-19.5'	Top of Rock @ 19.5'
					Run - 1 19.5' - 24.5' RQD = 57%
					Recovery 4.8' - 96%
					Green-gray GRANDIORITE 24.5'
25.0'					Run - 2 24.5' - 29.5' RQD = 60%
					Recovery 4.8' - 96%
					Green-gray GRANDIORITE 29.5'
30.0'					Run - 3 29.5' - 34.5' RQD = 67%
					Recovery 5.0' - 100%
					Green-gray GRANDIORITE 34.5'
35.0'					Run - 4 34.5' - 39.5' RQD = 80%
					Recovery 4.6' - 92%
					Green-gray GRANDIORITE 39.5'
40.0'					BOTTOM OF BORING 39.5'

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. GSD

DATE STARTED 6/9/83 COMPLETED 6/13/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					NOTE: 1. Core size = NX 2. Coring time in rock 8-10 min/ft; no water loss. 3. Installed 41.5' of 2" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G7S

DATE STARTED 6/23/83 COMPLETED 6/23/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 21' 21.0'
					BOTTOM OF BORING 21.0'
					NOTE: Installed 24.3' of 2" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

CON-TEC., INC.
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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G7D

DATE STARTED 6/15/83 **COMPLETED** 6/16/83

SURF. ELEV.

GROUND WATER 6/16 - 7a.m. - 7.0' HOLE @ 39'

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		2-5	1	0-2'	Brown, dry, medium-dense, fine to coarse GRAVEL, COBBLES, some fine to coarse sand, little silt 2.5'
		9-14			
		14-29	2	2'-4'	
		33-41			
5.0'		37-49	3	4'-6'	Light brown, dry, very dense, fine to coarse GRAVEL and fine to coarse SAND
		51-57			
		50/0			Wet @ 8'
		29-11	4	8'-10'	
10.0'		11-23			10.0'
		12-29	5	10'-11.4'	Olive-brown, moist, very dense SILT, some embedded fine to coarse gravel, trace embedded fine to coarse sand (occasional 1/8" - ½" layers of fine to medium sand)
		20/.4-50/0			
		18-24	6	12'-14'	
		21-27			
15.0'		18-18	7	14'-16'	
		20-59			
		75/.3-50/0		16'-16.3'	
		29-42	8	18'-20'	
20.0'		29-17			
25.0'		29-42		24'-25.5'	(Note: No sample recovery 16'-16.3' & 24'-25.5')
		47			Top of rock @ 28.5'
					Drilled with rock bit to 29.5'
					Run - 1 29.5' - 34.5' RQD = 13%
					Recovery 4.5' - 90%
30.0'					Broken, pink-gray-green GRANODIORITE 34.5'
					Run - 2 34.5' - 39.0' RQD = 37%
					Recovery 4.7' - 104%
35.0'					Broken, pink-gray-green GRANODIORITE 39.0'
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G7D

DATE STARTED 6/15/83 COMPLETED 6/15/83

SURF. ELEV.

GROUND WATER SEE PAGE 1

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
45.0'					Run - 3 39' - 44' RQD = 70% Recovery 4.4' - 88% Pink-gray-green GRANODIORITE 44.0'
50.0'					Run - 4 44' - 47.8' RQD = 98% Recovery 4.7' - 124% Broken pink-gray-green GRANODIORITE 47.8'
55.0'					Run - 5 47.8' - 51' RQD = 63% Recovery 3.2' - 100% Broken pink-gray-green GRANODIORITE 51.0'
					BOTTOM OF BORING 51.0'

NOTE:

1. Core size = NX
2. Coring time in rock 2-3 min/ft; no water loss.
3. Installed 52.8' of 2" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MA.

HOLE NO. G3OW

DATE STARTED 6/24/83 COMPLETED 6/30/83

SURF. ELEV.

GROUND WATER

JOB NO. 8340

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 44'
					Cored boulders from 17' - 26'
					44.0'
					BOTTOM OF BORING 44.0'
					NOTE: Installed 45.5' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-9S

DATE STARTED 8/28/84 COMPLETED

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 6.0'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 18' Installed 17.6' of 2" PVC riser pipe in borehole; bottom 5' section is slotted 18.0'

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-10S

DATE STARTED 9/10/84 COMPLETED 9/11/84

SURF. ELEV.

GROUND WATER 9/11 - 7am - 6.0'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		2-9	1	0-2'	Light brown, dry, loose medium to fine SAND .5'
		13-16			
		14-11	2	2'-3.5'	Tan, dry, medium dense to very dense fine SAND, SILT and fine to coarse GRAVEL, COBBLES 4.0'
		29-50/0			
5.0'		32-39	3	4'-6'	
		44-28			
		16-18	4	6'-8'	Light brown, dry, very dense fine to coarse SAND and fine to coarse GRAVEL 6.0'
		12-12			
		11-11	5	8'-10'	
10.0'		12-17			
		14-16	6	10'-12'	Light brown, moist, medium dense to dense SILT, little embedded fine to medium sand, trace embedded fine to coarse gravel, cobbles
		19-21			
		18-24	7	12'-14'	
		32-39			
15.0'		22-28	8	14'-16'	
		31-47			
		29-38	9	16'-17.4'	
		75/.4			
		22-28	10	18'-20'	
20.0'		36-47			
		28-38	11	20'-22'	TOP OF ROCK 22.0'
		44-51			
					Drilled with roller bit 25.0'
					BOTTOM OF BORING 25.0'
					Note: Installed 26.2' of 2" PVC riser in borehole; bottom 10' section is slotted.

TEST BORING LOG

CON-TEC., INC.
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603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-10D

DATE STARTED 9/17/84 COMPLETED 9/19/84

SURF. ELEV.

GROUND WATER 9/24 - 7.1'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" & 3" CASING; NQ WIRE LINE CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to top of rock @ 22.0'
25.0'					Run - 1 22.2' - 24.5' RQD - 30% Recovery 2.0' - 87% Gray, fine grained GRANODIORITE with occasional quartz stringers 24.5'
30.0'					Run - 2 24.5' - 34.3' RQD - 65% Recovery 9.3' - 95% Gray, fine grained GRANODIORITE with occasional quartz stringers 34.3'
35.0'					Run - 3 34.3' - 35.0' RQD - 0 Recovery 0 35.0'
40.0'					*Run - 4 35' - 36' RQD - 31% Recovery 1.6' - 160% Gray, fine grained GRANODIORITE with occasional quartz stringers 36.0'
45.0'					Run - 5 36' - 44.5' RQD - 50% Recovery 8.2' - 96% Gray and pink medium to coarse grained GRANODIORITE with quartz stringer 44.5'
					BOTTOM OF BORING 44.5' *1. Core broken while drilling 2. Coring time in rock averaged 3 to 6 min/ft; no water loss. 3. Installed 47' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

CON-TEC., INC.
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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-10DB

DATE STARTED 9/11/84 COMPLETED 9/17/84

SURF. ELEV.

GROUND WATER 9/12 - 7am - 7.1' 9/24 - 7.1'
9/14 - 7am - 6.6'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" & 3" CASING; NQ WIRE LINE CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to top of rock @ 23.0'
25.0'					Run - 1 23.7' - 29.5' RQD - 25% Recovery 5.6' - 97% Gray, fine grained GRANODIORITE with occasional quartz stringers 29.5'
30.0'					Run - 2 29.5' - 34.0' RQD - 49% Recovery 4.7' - 104% Gray, fine grained GRANODIORITE with occasional quartz stringers 34.0'
35.0'					Run - 3 34.0' - 42.9' RQD - 38% Recovery 8.7' - 98% Gray, fine grained GRANODIORITE with occasional quartz stringers 42.9'
40.0'					Run - 4 42.9' - 49.5' RQD - 73% Recovery 6.3' - 95% Gray, fine grained GRANODIORITE with occasional quartz stringers 49.5'
45.0'					Run - 5 49.5' - 54.5' RQD - 47% Recovery 5.1' - 102% Gray to pink, fine to coarse grained GRANODIORITE with quartz stringers 54.5'
50.0'					Run - 6 54.5' - 64.4' RQD - 56% Recovery 10.0' - 101% Gray and pink medium grained to coarse grained GRANODIORITE
55.0					
60.0'					

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-10DB

DATE STARTED 9/11/84 COMPLETED 9/17/84

SURF. ELEV.

GROUND WATER See pg. 1

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

NQ WIRE LINE CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					64.4'
65.0'					Run - 7 64.4' - 74.2' RQD - 70% Recovery 9.6' - 98% Gray and pink, medium grained to coarse grained GRANODIORITE with occasional quartz stringers
70.0'					
					74.2'
75.0'					Run - 8 74.2' - 83.7' RQD - 61% Recovery 9.9' - 104% Gray and pink, medium grained to coarse grained GRANODIORITE with occasional quartz stringers
80.0'					
					83.7'
85.0'					Run - 9 83.7' - 93.6' RQD - 70% Recovery 9.9' - 100% Gray and pink, medium grained to coarse grained GRANODIORITE with occasional quartz stringers
90.0'					
					93.6'
95.0'					Run - 10 93.6' - 100' RQD - 91% Recovery 6.4' - 100% Gray and pink, medium grained to coarse grained GRANODIORITE with occasional quartz stringers
100.0'					100.0'

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-10DB

DATE STARTED 9/11/84 COMPLETED 9/17/84

SURF. ELEV.

GROUND WATER See pg. 1

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

NQ WIRE LINE CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
100.0'					100.0'
					BOTTOM OF BORING 100.0'

Note:

1. Coring time in rock averaged 3 to 6 min/ft.; no water loss.
2. Installed 72.4' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

CON-TEC., INC.
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603-224-0020

PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS. HOLE NO. G-11S

DATE STARTED 8/30/84 COMPLETED 9/1/84 SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 17.0' JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" & 3" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
0.0'		2-3	1	0-2'	Brown, dry, medium dense SILT, fine SAND and COBBLES 3.0'
		17-15			
		7-8	2	2'-4'	TOPSOIL 4.0'
		5-11			
5.0'		5-110	3	4'-5'	Light brown, dry, medium dense to very dense, fine to medium SAND and fine to coarse GRAVEL, COBBLES, little silt 8.0'
		103/.4	4	5'-5.4'	
10.0'					Light gray, moist, very dense SILT and fine SAND, trace embedded fine to medium gravel 14.0'
		80-75/.4	5	10'-10.9'	
15.0'					Light brown, moist, very dense SILT and fine SAND, trace embedded fine to medium gravel 21.0'
		50-86	6	15'-16'	
20.0'					BOTTOM OF BORING 21.0'
		25-100/.1	7	20'-20.6'	
25.0'					Note: Installed 22' of 2" PVC riser pipe in borehole; bottom 5' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-11D

DATE STARTED 9/4/84 COMPLETED

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 17.0'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" & 3" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 24.0'
					TOP OF ROCK 24.0'
25.0'					Drilled with roller bit to 30'.
30.0'					Run - 1 30' - 35' RQD - 60%
					Recovery 5.0' - 100%
35.0'					Gray and pink, medium to coarse grained GRANODIORITE with occasional quartz stringers 35.0'
					Run - 2 35' - 40' RQD - 89%
40.0'					Recovery 3.6' - 72%
					Gray and pink, medium to coarse grained GRANODIORITE with occasional quartz stringers 40.0'
45.0'					Run - 3 40' - 44' RQD - 85%
					Recovery 4.8' - 120%
					Gray and pink, medium to coarse grained GRANODIORITE with occasional quartz stringers 44.0'
					BOTTOM OF BORING 44.0'
					Note: 1. Coring time in rock 5 to 9 min/ft.; slight water loss.
					2. Installed 45' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-12S

DATE STARTED 9/17/84 COMPLETED 9/18/84

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 18.5'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 25'
					TOP OF ROCK 25.0'
					BOTTOM OF BORING 25.0'
					Note: 1. First attemot to drill hole had refusal at 5.5'; moved hole 2' South.
					2. Installed 28' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-12D

DATE STARTED 9/12/84 COMPLETED 9/14/84

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 17.5'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		3-10	1	0-2'	TOPSOIL .5'
		16-14			
		15-16	2	2'-4'	Light brown, dry, dense fine to medium SAND, little fine to medium gravel, little silt 4.0'
		7-6			
5.0'		2-76	3A	4'-4.5'	
		38	3B	4.5'-5.5'	Brown, moist, loose SILT, trace fine to medium sand 4.5'
		16-75/.3	4	6'-6.9'	
					Light brown, dry, very dense fine to medium SAND, trace fine to medium gravel 5.5'
10.0'					
		49-100	5	10'-11'	Light gray-brown, dry, very dense fine to coarse SAND, trace fine to medium gravel 8.5'
15.0'					
		42-90	6	15'-17'	Gray, moist, very dense fine to coarse SAND and SILT, trace fine to medium gravel 14.0'
		62-50			
20.0'					Light brown, moist, very dense fine to medium SAND and SILT, little embedded fine to medium gravel 18.0'
		32-70	7	20'-22'	
		85-85			Light brown, wet, very dense fine to medium SAND, trace fine gravel
25.0'					TOP OF ROCK 25.5'
		100/.5	8	25'-25.5'	Drilled with roller bit to 27.5'
					Run - 1 27.5' - 32.5' RQD - 100%
30.0'					Recovery 4.0' - 80%
					Gray, fine grained GRANODIORITE 32.5'
					Run - 2 32.5' - 36.5' RQD - 98%
35.0'					Recovery 4.8' -120%
					Gray, medium grained GRANODIORITE 36.5'
					Run - 3 36.5' - 41.5' RQD - 93%
40.0'					Recovery 4.2' - 84%

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. G-12D

DATE STARTED 9/12/84 COMPLETED 9/14/84

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 17.5'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Gray, medium grained GRANODIORITE 41.5'
45.0'					Run - 4 41.5' - 46' RQD - 68% Recovery 4.7' - 104% Gray, medium grained GRANODIORITE 46.0'
					BOTTOM OF BORING 46.0'

Note: 1. Coring time in rock 3 to 6 min/ft.; no water loss.

2. Installed 49' of 1½" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. GO-1S

DATE STARTED 10/3/84 COMPLETED 10/4/84

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 14.5'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 18.0'
					TOP OF ROCK 18.0'
					BOTTOM OF BORING 18.0'
					Note: Installed 20.5' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. GC-1D

DATE STARTED 10/1/84 COMPLETED 10/4/84

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 14.5'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" & 3" CASING; NQ WIRE LINE CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to top of rock 19.0'
20.0'					Run - 1. 19.0' - 25.1' Recovery 5.9' - 97% Light gray, medium grained GRANODIORITE 25.1'
25.0'					Run - 2 25.1' - 30.3' Recovery 5.3' - 102% Light gray, medium grained GRANODIORITE 30.3'
30.0'					Run - 3 30.3' - 38.0' Recovery 7.8' - 101% Light gray, medium grained GRANODIORITE 38.0'
35.0'					Run - 4 38.0' - 39.3' Recovery 1.2' - 92% Light gray, medium grained GRANODIORITE 39.3'
40.0'					BOTTOM OF BORING 39.3'
					Note: 1. Coring time in rock 3 to 6 min/ft.; no water loss. 2. Installed 42' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. GO-1DB

DATE STARTED 9/25/84 COMPLETED 10/1/84

SURF. ELEV.

GROUND WATER 9/26 - 14.3' CASING @ 19'; HOLE @ 34.5'
9/27 - 14.0' CASING @ 19'; HOLE @ 60.5'
10/1 - 14.1' CASING @ 19'; HOLE @ 60.5'

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" & 3" CASING; NQ WIRE LINE CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		3-11	1	0-2'	TOPSOIL .3'
		19-18			
		26-24	2	2'-4'	Light brown, dense to very dense fine to coarse GRAVEL and medium to fine SAND 4.0'
		30-41			
5.0'		26-34	3A	4'-6'	
		39-48	3B		Light gray-green, moist, very dense SILT and fine SAND, little embedded fine to coarse gravel
		46-56	4	6'-7.3'	
		75/.3			
10.0'					13.0'
		29-56	5	10'-11.3'	
		75/.3			
15.0'					Light brown, wet, medium dense fine to medium SAND, little embedded fine to coarse gravel, trace silt 17.0'
		12-16	6	15'-17'	
		12-12			TILL 19.0'
20.0'					Drilled in rock with roller bit to 19.3'
					Run - 1 19.3' - 26.8' RQD - 32%
					Recovery 7.3' - 97%
25.0'					Light gray, medium grained GRANODIORITE 26.8'
					Run - 2 26.8' - 34.5' RQD - 70%
					Recovery 7.7' - 100%
30.0'					Light gray, medium grained GRANODIORITE 34.5'
					Run - 3 34.5' - 44.4' RQD - 90%
					Recovery 9.7' - 98%
35.0'					Light gray and pink coarse grained GRANODIORITE
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE & CO. - CRYOVAC DIVISION

LOCATION WASHINGTON ST., WOBURN, MASS.

HOLE NO. GO-1DB

DATE STARTED 9/25/84 COMPLETED 10/1/84

SURF. ELEV.

GROUND WATER See pg. 1

JOB NO. 8447

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

NQ WIRE LINE CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					44.4'
45.0'					Run - 4 44.4' - 49.1' RQD - 100% Recovery 4.2' - 89% Light gray and pink coarse grained GRANODIORITE 49.1'
50.0'					Run - 5 49.1' - 54.5' RQD - 66% Recovery 5.6' - 96% Light gray and pink coarse grained GRANODIORITE 54.5'
55.0'					Run - 6 54.5' - 60.6' RQD - 62% Recovery 5.5' - 90% Light gray and pink coarse grained GRANODIORITE 60.6'
60.0'					Run - 7 60.6' - 70.6' RQD - 74% Recovery 9.9' - 99% Light gray and pink coarse grained GRANODIORITE 70.6'
65.0'					BOTTOM OF BORING 70.6'
70.0'					Note: 1. Coring time in rock 3 to 6 min/ft.; No water loss. 2. Installed 73' of 1¼" PVC riser pipe in borehole; bottom 15' section is slotted
75.0'					

TEST BORING LOG

CON–TEC., INC.
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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** Manhole

DATE STARTED 10/10/85 **COMPLETED** 10/10/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

SHEET 1 **OF** 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Pump manhole dry;
					Recovered sledge sample from bottom
5.0'					
					Bottom of Manhole 7.5'
		5-38	1	8'-10'	CONCRETE 8.0'
10.0'		33-28			
		25-43	2	10'-12'	Light brown, wet, medium dense, coarse to fine SAND 8.5'
		66-43			
					Olive-brown, moist, very dense SILT, little embedded fine to coarse gravel, trace embedded fine to medium sand
15.0'					
		22-26	3	15'-17'	
		26-34			
20.0'					
		50-77	4	20'-21.4'	
		125/.4			21.4'
					BOTTOM OF BORING 21.4'
25.0'					
					Note: Hole sealed with bento-nite-cement grout from 7.5' to 21.4'.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

HOLE NO. 13S

DATE STARTED 9/25/85 **COMPLETED** 9/26/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 27.5' Installed 29.5' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 13D

DATE STARTED 9/12/85 **COMPLETED** 9/25/85 **SURF. ELEV.**

GROUND WATER DEPTH ON COMPLETION - 16.0' **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		27-7	1	0-2'	ASPHALT .2'
		11-10			
		8-10	2	2'-4'	Light brown, dry, medium dense, fine to medium SAND, trace fine
		22-45			
5.0'		50-76	3	4'-5.4'	gravel, trace silt 3.0'
		120/.4			
		100-100/.4	4	6'-6.9'	Light brown, dry, very dense coarse to fine SAND, some medium to fine gravel, occasional cob-
		100/0		8'	bles, trace silt 6.0'
10.0'					
		22-31	5	10'-12'	Gray, dry, very dense, fine to meidum SAND, some coarse to fine
		50-46			
		30-100/.4	6	12'-12.9'	gravel, cobbles, little silt
15.0'		47-52	7	14'-15.4'	
		100/.4			
		37-68	8	16'-17.4'	
		100/.4			
		87-64	9	18'-19.4'	
20.0'		75/.4			
		16-42	10	20'-21.4'	
		75/.4			
25.0'					TOP OF ROCK @ 25.8'
		14-75/.4	11	25'-25.9'	Run - 1 29.0' - 32.6' RQD-69%
					Recovery - 3.5' - 97% 32.6'
30.0'					Run - 2 32.6' - 42.5' RQD-86%
					Recovery 9.2' - 93%
35.0'					
40.0'					

TEST BORING LOG

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603-224-0020

PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

HOLE NO. 13D

DATE STARTED 9/12/85 **COMPLETED** 9/25/85

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 16.0'

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					42.5'
					Run - 3 42.5' - 52.2' RQD-98%
45.0'					Recovery - 10.0' - 103%
50.0'					
					52.2'
55.0'					BOTTOM OF BORING 52.0'

Note:
1. Coring time in rock averaged 4 to 6 min/ft; no water loss.
2. Rock type- Gray, medium-grained GRANODIORITE
3. Installed 55.5' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

CON-TEC., INC.
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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 14D

DATE STARTED 10/1/85 **COMPLETED** 10/3/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		26-11	1	0-2'	ASPHALT .2'
		8-10			
		10-10	2	2'-4'	Light brown, dry, medium dense, fine SAND, trace fine to medium gravel 2.0'
		11-15			
5.0'		45-98	3	4'-6'	
		105-99			
		125-132/.3	4	6'-6.8'	Light brown, dry, medium dense to very dense, fine to medium SAND, little to some fine to coarse gravel 7.0'
		15-12	5	8'-10'	
10.0'		11-9			
		17-15	6	10'-12'	Light gray-brown, moist, medium to dense SILT and fine SAND, little embedded fine to medium gravel 14.0'
		13-17			
		14-19	7	12'-14'	
		22-21			
15.0'		13-25	8	14'-16'	
		92-33			Light gray-brown, moist, very dense, SILT, little embedded fine to coarse gravel, little embedded fine sand
		38-40	9	16'-18'	
		87-120			
		50/0		18'	
20.0'					
		18-17	10	20'-22'	TOP OF ROCK 22.7'
		13-9			
					Run - 1 22.7' - 30.7' RQD-60%
					Recovery 7.9' - 99%
25.0'					
					30.7'
30.0'					
					Run - 2 30.7' - 39.7' RQD-83%
					Recovery 9.0' - 100%
35.0'					
					39.7'
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

HOLE NO. 14D

DATE STARTED 10/1/85 **COMPLETED** 10/3/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Run - 3 39.7' - 42.7' RQD-57%
					Recovery 2.8' - 93%
45.0'					42.7'
					BOTTOM OF BORING 42.7'
					Note: 1. Coring time in rock averaged 5 to 8 min/ft; no water loss.
					2. Gray, medium-grained GRANODIORITE
					3. Installed 45.4' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 15S

DATE STARTED 10/2/85 **COMPLETED** 10/2/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH HOLLOW STEM AUGER CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 24.5'
					Installed 23.5' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 15D

DATE STARTED 9/26/85 **COMPLETED** 10/1/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		4	1	.5'-1.1'	CONCRETE .5'
		75/.1			
		12-15	2	2'-4'	Brown, dry, loose, SILT and fine SAND 1.1'
		12-27			
5.0'		25-46	3	4'-5.1'	CONCRETE 1.8'
		75/.1			
		54-50	4	6'-8'	Light brown, dry, medium to dense, fine to medium SAND, little fine to coarse gravel, cobbles 4.0'
		43-38			
		18-12	5	8'-10'	
10.0'		8-10			
		18-75	6	10'-12'	Light gray-brown, dry, very dense SILT and fine to medium SAND, little embedded fine to coarse gravel, occasional cobble 8.0'
		110-77			
		69-97	7	12'-13.5'	
		89			
15.0'		28-30	8	14'-16'	Light gray-brown, moist, medium dense to very dense SILT, little embedded fine to coarse gravel, little embedded fine sand
		32-43			
		38-43	9	16'-18'	
		44-48			
		85-75/.4	10	18'-18.9'	
20.0'					
		18-23	11	20'-22'	
		26-38			
					TOP OF ROCK 23.9'
					Run - 1 26.1' - 31.1' RQD-37%
25.0'					Recovery 4.7' - 94%
30.0'					
					31.1'
					Run - 2 31.1' - 40.5' RQD-61%
					Recovery 9.7' - 103%
35.0'					
40.0'					

TEST BORING LOG

CON–TEC., INC.
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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 15D

DATE STARTED 9/26/85 **COMPLETED** 10/1/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					40.5'
					Run - 3 40.5' - 46.5' RQD-53%
					Recovery 6.0' - 100% 46.5'
					BOTTOM OF BORING 46.5'
					Note: 1. Coring time in rock averaged 1 to 3 min/ft; no water loss.
					2. Rock type- gray, medium-grained GRANODIORITE
					3. Installed 46.5' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-16S

DATE STARTED 10/18/85 **COMPLETED** 10/22/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		17-18		0-2'	ASPHALT .3'
		14-14			
		8-8	1	2'-4'	Olive-brown, dry, medium dense, fine SAND, SILT and coarse to
		13-25			
5.0'		13-8	2	4'-6'	fine GRAVEL, trace cobbles 4.0'
		8-5			Light brown, wet, medium dense, fine to medium SAND, trace fine to medium gravel, occasional cobbles, trace silt
		4-7	3	6'-8'	
		18-13			
		10-30	4	8'-10'	
10.0'		27-11			
		5-7	5	10'-12'	
		8-10			12.0'
		30-45	6	12'-13.8'	Light brown, moist, very dense, fine to medium SAND, little embedded fine to coarse gravel, cobbles, little silt
		51-75/.3			
15.0'		75/0		14'	
		69-73	7	15'-17'	
		25-41			
		75/.4	8	17'-17.4'	18.0'
					COBBLES @ 18' to 20'
20.0'		75/0		19'	
		30-43	9	20'-22'	Gray, moist, very dense SILT, little embedded fine to coarse gravel, cobbles, trace embedded fine to medium sand
		55-27			
25.0'					
		27-75/.4	10	25'-25.9'	
30.0'					TOP OF ROCK @ 29.6'
					DRILLED WITH ROLLER BIT TO 32.0'
					BOTTOM OF BORING 32.0'
					Note: 1. No sample recovered at at 0-2'.
					2. Installed 30' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 16D

DATE STARTED 10/25/85 **COMPLETED** 10/29/85 **SURF. ELEV.**

GROUND WATER 10/29- 7A.M. - 7.0' Hole @ 47.8' **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 **OF** 1

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to rock at 37.5'
35.0'					37.5'
					Run - 1 37.8' - 38.8' RQD-0%
40.0'					Recovery 1.0' - 100% 39.0'
					Run - 2 38.8' - 47.8' RQD-91%
45.0'					Recovery 8.9' - 99% 47.8'
					Run - 3 47.8' - 57.3' RQD-75%
50.0'					Recovery 8.1' - 85% 57.3'
					Run - 4 57.3' - 60.0' RQD-137%
55.0'					Recovery 4.1' - 152% 60.0'
60.0'					BOTTOM OF BORING 60.0'

Note:
1. Coring time in rock averaged 3 to 5 min./ft; no water loss.
2. Rock type- Gray, medium grained GRANODIORITE
3. Installed 59.5' of 1½" PVC riser pipe in bore: hole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-17S

DATE STARTED 10/17/85 **COMPLETED** 10/18/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 49.5'
					Installed 47' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 17D

DATE STARTED 10/11/85 **COMPLETED** 10/17/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 9" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		11-9	1	0-2'	ASPHALT .2'
		8-12			
		13-27	2	2'-4'	Olive-brown, moist, medium dense SILT, little embedded fine to medium gravel, little embedded fine sand 2.0'
		33-42			
5.0'		20-40	3	4'-6'	
		40-47			
		17-20	4	6'-8'	Olive-brown, moist, very dense SILT, little fine sand, little fine sand, little embedded fine to coarse gravel, occasional cobble
		25-23			
		21-42	5	8'-10'	
10.0'		50-63			
		100/.3	6	10'-10.3'	
		17-52	7	12'-14'	
		69-69			
15.0'		100/.4	8	14'-14.4'	
		19-24	9	16'-17.4'	
		100/.4	10		
		31-69		18'-20'	
20.0'		35-105			
		100/0		20'	BOULDER 20' - 21.1'
25.0'					
		25-32	11	25'-27'	
		21-40			
30.0'					COBBLES
		28-30	12	30'-31.6'	Note: Drilled open hole from 9' to 35'; at 35' hole began to cave in: possibly sand and gravel layer from 33' to 38'
		60-50/.1			
35.0'					
		50/0		35'	
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-17D

DATE STARTED 10/11/85 **COMPLETED** 10/17/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		35-20	14	40'-42'	Gray, moist, hard SILT, little clay, trace embedded fine to medium sand, trace embedded fine gravel
		20-23			
45.0'					
		25-20	15	45'-47'	
		20-23			
50.0'					
		100/.3		50'-50.3'	No sample recovered at 50.3'
					TOP OF ROCK 50.3'
55.0'					Run - 1 52.0' - 58.6' RQD-56% Recovery 5.7' - 86% 58.6'
60.0'					Run - 2 58.6' - 62.7' RQD-37% Recovery 3.2' - 78% 62.7'
.0'					Run - 3 62.7' - 65.9' RQD-59% Recovery 2.7' - 84% 65.9'
					Run - 4 65.9' - 67.5' RQD-37% Recovery 1.3' - 81% 67.5'
					Run - 5 67.5' - 72.0' RQD-47% Recovery 4.7' - 104% 72.0'
					BOTTOM OF BORING 72.0'

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINTON STREET - WOBURN, MA **HOLE NO.** B-17D

DATE STARTED 10/11/85 **COMPLETED** 10/17/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING: NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Note: 1. Coring time in rock averaged from 2 min. to 6 min./ft.; no water loss. 2. Rock type- highly weathered gray-green, fine to medium grained GRANODIORite with quartz stringer from 50.5' to 66' 66'-72': same rock but sound 3. Installed 72' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 18S

DATE STARTED 10/9/85 **COMPLETED** 10/9/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 33.5'
					Installed 31.8' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-18D

DATE STARTED 10/1/85 **COMPLETED** 10/7/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		5	1	.5'-2.5'	ASPHALT .4'
		6-6			Light brown, dry, medium dense to very dense SILT, some embedded fine to coarse gravel, little embedded fine to medium sand 6.0'
		9-16	2	2.5'-3.1'	
		50/.1			
5.0'		20-27	3	4'-6'	
		34-41			
		62-36	4	6'-8'	
		36-25			
		18-41	5	8'-10'	Light brown, moist, very dense fine to medium SAND, little silt, little embedded fine to coarse gravel 8.0'
10.0'		41-41			
					Olive-brown, moist, very dense SILT, little embedded fine to coarse gravel, cobbles, trace embedded fine to medium sand 17.0'
		21-27	6	13'-15'	
15.0'		40-43			
					Olive-gray, moist, very dense SILT and fine SAND, little embedded fine to coarse gravel, cobbles
		100/.3	7	18'-18.3'	
20.0'					
		128	8	23'-23.5'	
25.0'					
		106	9	28'-28.5'	
30.0'					
					TOP OF ROCK 33.0'
		100/.1		33'-33.1'	Run - 1 33.1' - 38.1' RQD-88%
35.0'					Recovery 4.7' - 94%
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN **HOLE NO.** B-18D

DATE STARTED 10/1/85 **COMPLETED** 10/7/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Run - 2 38.1' - 43.0' RQD-82%
					Recovery 4.7' - 96% 43.0'
45.0'					Run - 3 43.0' - 48.0' RQD-52%
					Recovery 4.9' - 98% 48.0'
50.0'					Run - 4 48.0' - 53.0' RQD-78%
					Recovery 4.4' - 88% 53.0'
55.0'					BOTTOM OF BORING 53.0'

Note: 1. Coring time in rock averaged 8 to 12 min./ft.; no water loss.

2. Rock Type- Gray, medium-grained GRANODIORITE

3. Installed 52' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

HOLE NO. B-19S

DATE STARTED 11/6/85 **COMPLETED** 11/6/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 21.0' Installed 20' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

HOLE NO. B-19M

DATE STARTED 11/4/85 **COMPLETED** 11/6/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 52.0'
					TOP OF WEATHERED ROCK 47.0'
					Drilled into weathered rock with roller bit 52.0'
					BOTTOM OF BORING 52.0'
					Note: Installed 44.5' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-19D

DATE STARTED 10/30/85 **COMPLETED** 11/4/85 **SURF. ELEV.**

GROUND WATER 11/4- 7A.M. - 8.0' Hole @ 75.0' **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		-5	1	.5'-2'	ASPHALT .3'
		6-6			
		5-7	2	2'-4'	Light gray-blue, dry, medium dense SILT, some fine to medium sand, trace embedded fine to medium gravel
		6-8			
5.0'		8-10	3	4'-6'	
		12-12			
		14-14	4	6'-8'	
		19-19			
		19-14	5	8'-10'	Sample wet @ 8.5' 9.0'
10.0'		15-16			
		8-20	6	10'-12'	Light brown, wet, very dense, fine to medium SAND, little fine tomedium gravel, trace silt 12.0'
		44-49			
		24-28	7	12'-14'	
		32-39			
15.0'		26-29	8	14'-16'	Olive-brown, moist, very dense SILT, little embedded fine to coarse gravel, trace embedded fine to medium sand
		34-37			
		16-24	9	16'-18'	
		32-41			
		22-37	10	18'-20'	
20.0'		36-48			
		44-75/.4	11	20'-20.9'	22.0'
					Gray, moist, very dense SILT, some embedded fine to coarse gravel, trace embedded fine to medium sand, occasional cobbles
25.0'		52	12	24.5'-25.3'	
		75/.3			
30.0'		21	13	29.5'-31.5'	
		22-42			
		48			
35.0'		88	14	34.5'-36.5'	
		36-41			
		54			
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-19D

DATE STARTED 10/30/85 **COMPLETED** 11/4/85 **SURF. ELEV.**

GROUND WATER 11/4- 7A.M. - 8.4' **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					NX CORE- 39.2' - 42.2'
					Recovery 1.0'
45.0'					COBBLES and GLACIAL TILL 42.2'
		28-51	15	45'-46.2'	Gray, wet, very dense SILT, some embedded fine to coarse gravel, cobbles, trace embedded fine to medium sand 49.0'
		78/.2			
50.0'					
		41-103	16	50'-51'	Orange-brown, moist, very dense SILT, little embedded fine to medium gravel, little fine sand 54.0'
55.0'					
		100/3	17	55'-55.3'	Brown, very dense, weathered rock 58.5'
60.0'					Hard rock- drilled with roller bit to 60.0'
					Run - 1 60.0' - 62.5' RQD-0%
					Recovery 2.5' - 100% 62.5'
65.0'					Run - 2 62.5' - 63.7' RQD-0%
					Recovery 1.2' - 100% 63.7'
70.0'					Drilled into highly fractured and weathered rock with roller bit
75.0'					75.0'
					BOTTOM OF BORING 75.0'

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-19D

DATE STARTED 10/30/85 **COMPLETED** 11/4/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Note: 1. Coring time in rock averaged 10 min./ft.; no water loss. 2. Rock type- highly broken and weathered gray GRANODIORITE 3. Installed 73.8' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-20S

DATE STARTED 10/25/85 **COMPLETED** 10/25/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

SHEET 1 **OF** 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 36.0' Installed 35' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-20M

DATE STARTED 10/24/85 **COMPLETED** 10/24/85 **SURF. ELEV.**

GROUND WATER DEPTH ON COMPLETION - 4.5' **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

SHEET 1 **OF** 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 63.5' Installed 58.4' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

CON–TEC., INC.
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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-20D

DATE STARTED 10/18/85 **COMPLETED** 10/23/85 **SURF. ELEV.**

GROUND WATER Depth after 48 Hours - 5.0' **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		12-10	1	0-2'	ASPHALT .2'
		7-10			
		11-21	2	2'-4'	Light brown, dry, medium dense, fine SAND and SILT, little embedded fine to medium gravel 2.5'
		25-24			
5.0'		29-39	3	4'-6'	
		55-62			
		32-40	4	6'-8'	Light brown, dry, medium dense SILT, little embedded fine to coarse gravel, little embedded fine to medium sand
		50-59			
		50/0		8'	
10.0'					
		28-36	5	10'-12'	
		32-38			
		50/0		12'	
15.0'		30-90	6	14'-15'	
		100/0		16'	
		100/.4	7	19'-19.4'	
20.0'					
					23.0'
25.0'		44-38	8	24'-25.5'	Gray, moist, very dense SILT, little embedded fine to coarse gravel, trace embedded fine to medium sand, trace clay
		95			
					29.0'
30.0'		100	9	29'-29.5'	Brown-gray, wet, very dense, fine to medium SAND and SILT, little fine to coarse gravel
					36.0'
35.0'		100	10	34'-34.5'	Gray, wet, very dense SILT, little embedded fine to coarse gravel, little embedded fine to medium sand
40.0'		100/.3	11	39'-39.3'	

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA.

HOLE NO. B-20D

DATE STARTED 10/18/85 **COMPLETED** 10/23/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		80-100/4	11	40'-40.9'	Gray, wet, very dense SILT, little embedded fine to coarse gravel, little embedded fine to medium sand
45.0'					
		100/.3		45'-45.3'	No sample recovery @ 45'
					48.0'
50.0'					Orange-brown, wet, very dense, fine to medium SAND and SILT, little fine to medium gravel
		101-100/4	13	50'-50.9'	
55.0'					
		125	14	55'-55.5'	
60.0'					
		100/.3		60'-60.3'	No sample recovery
					TOP OF ROCK 63.5'
65.0'					Run - 1 65' - 71.5' RQD - 12%
		100		65'	Recovery 6.5'- 100%
70.0'					71.5'
					Run - 2 71.5' - 75' RQD - 0%
75.0'					Recovery 3.5' - 100%
					75.0'
					Drilled with roller bit to 85'
80.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA. **HOLE NO.** B-20D

DATE STARTED 10/18/85 **COMPLETED** 10/23/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled with roller bit @ 1 min/ft.
85.0'					85.0'
					BOTTOM OF BORING 85.0'
					Note; 1. No sample recovery from 39', 45' or 60'. 2. Coring time in rock 1 to 5 min/ft.; no water loss. 3. Rock type-Very weathered and broken, gray, medium-grained GRANODIORITE. 4. Installed 85' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 21S

DATE STARTED 10/10/85 **COMPLETED** 10/10/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

SHEET 1 **OF** 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 29.5'
					Installed 28.9' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-21D

DATE STARTED 10/7/85 **COMPLETED** 10/10/85 **SURF. ELEV.**

GROUND WATER DEPTH AFTER 13 HOURS - 20.5' **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		2-7	1	0-2'	TOPSOIL 1.0'
		20-17			
		12-22	2	2'-4'	Light brown, dry, medium dense to very dense fine to medium SAND, SILT and fine to coarse GRAVEL
		12-7			
5.0'		7-23	3	4'-6'	
		41-55			
		45-50	4	6'-8'	7.0'
		61-87			
		69-76	5	8'-9.5'	Light brown, dry, very dense, medium to fine SAND and fine to coarse GRAVEL, trace silt 10.0'
10.0'		86			
		22-32	6	10'-12'	Light brown, dry, very dense, medium to fine SAND, little fine to coarse gravel, cobbles
		46-55			
		52-50	7	12'-14'	
		60-49			
15.0'		40-51	8	14'-16'	
		56-83			
		72-57	9	16'-17.9'	18.0'
		45-100/.4			
		21-35	10	14'-20'	Light brown, moist, very dense fine to medium SAND, some silt, little embedded fine to coarse gravel 20.0'
20.0'		27-21			
		35-40	11	20'-22'	
		50-60			
					Light brown, wet, very dense fine SAND 25.0'
25.0'					
		108	12	25'-25.5'	Light brown-gray, wet, very dense fine to medium SAND, little silt, little embedded fine to coarse gravel
					TOP OF ROCK 28.0'
					Run - 1 29.0' - 34.0' RQD-68%
35.0'					Recovery 4.2' - 84% 34.0'
					Run - 2 34.0' - 36.5' RQD-28%
					Recovery 4.2' - 84% 36.5'
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA. **HOLE NO.** B-21D

DATE STARTED 10/7/85 **COMPLETED** 10/10/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Run - 3 36.5' - 37.5' RQD-28%
					Recovery .7' - 70% 37.5'
45.0'					Run - 4 37.5' - 42.5' RQD-0
					Recovery 4.6' - 92% 42.5'
					Run - 5 42.5' - 49.5' RQD-50%
50.0'					Recovery 6.2' - 89% 49.5'
					BOTTOM OF BORING 49.5'

Note: 1. Coring time in rock averaged 10-15 min/ft.; lost 50% of water while coring from 34' to 49.5'.

2. Rock Type-Gray, medium-grained GRANODIORITE.

3. Installed 5' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 22S

DATE STARTED 9/4/85 **COMPLETED** 9/6/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		1-9	1	0-2'	TOPSOIL .3'
		11-14			
		12-15	2	2'-4'	Light brown-gray, moist, medium dense, fine SAND, trace fine to
		12-14			
5.0'		11-31	3	4'-6'	medium gravel, trace silt 2.0'
		42-91			
		84-89	4	6'-7.2'	Light brown, moist, medium dense, fine to medium SAND, little fine
		100/.2			
		42-75/.4	5	8'-8.9'	to coarse gravel 4.5'
10.0'					
		73-75/.4		10'-10.9'	Light brown, dry, very dense, medium to fine SAND and coarse to fine GRAVEL, COBBLES
					13.0'
		21-63	6	12'-13.4'	
		100/.4			COBBLES and coarse to fine GRAVEL
15.0'					15.0'
		26	7	15.5'-17.5'	
		32-37			
		51-34	8	17.5'-19.5'	Light brown, wet, very dense, fine to medium SAND, trace fine
		32-37			to coarse gravel
20.0'		46			
		11-22	9	20'-22'	
		27-27			
					23.0'
25.0'					Olive-brown, wet, very dense, SILT, little embedded fine to
		16-43	10	25'-27'	coarse gravel, little embedded
		47-65			fine to medium sand
30.0'					
		21-50	11	30'-32'	TOP OF ROCK 32.2'
		80-83			Drilled with roller bit to 33.0'
35.0'					BOTTOM OF BORING 33.0'
					Note: Installed 34.8'of 2" PVC riser pipe in borehole; bottom 15' section is slotted.
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-22D

DATE STARTED 9/9/85 **COMPLETED** 9/12/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to bedrock
					TOP OF ROCK 32.5'
30.0'					Run - 1 32.8' - 36.7' RQD-0
					Recovery 3.2' - 82% 36.7'
35.0'					Run - 2 36.7' - 41.3' RQD-26%
					Recovery 4.0' - 87% 41.3'
40.0'					Run - 3 41.3' - 46.1' RQD-0
					Recovery 2.6' - 54% 46.1'
45.0'					Run - 4 46.1' - 52.8' RQD-45%
					Recovery 4.6' - 67% 52.8'
50.0'					BOTTOM OF BORING 52.8'
					Note: 1. Coring time in rock averaged 8 to 10 min/ ft; no water loss.
55.0'					2. Rock type- Gray, broken, medium grained GRANODIORITE
					3. Installed 52.7' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE - CRYOVAC DIVISION

LOCATION WASHINTON STREET - WOBURN, MA **HOLE NO.** B-23S

DATE STARTED 10/10/85 **COMPLETED** 10/15/85 **SURF. ELEV.**

GROUND WATER Depth After 72 Hours - 20' **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

SHEET 1 **OF** 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		75/0		.5'	ASPHALT .3'
		56-75/.1	1	2'-2.6'	Dark brown, dry, very dense coarse to fine GRAVEL, COBBLES, and fine to coarse SAND
5.0'		28-45	2	4'-5.6'	
		57-75/.1			
		67-90	3	6'-7.1'	7.5'
		75/1			
		32-75/.4	4	8'-8.9'	Light brown-gray, wet, very dense fine SAND and SILT, little embedded fine to coarse gravel, cobbles
10.0'					
		24-25	5	10'-12'	
		40-43			
		75/0		12'	13.0'
15.0'		56-47	6	14'-16'	Light gray, moist, very dense fine to medium SAND, little embedded fine to coarse gravel, trace silt
		43-59			
20.0'		28-32	7	19'-21'	
		33-29			
					TOP OF ROCK 24.5'
25.0'		15/.4-50/0		24'-24.4'	Drilled with roller bit to 26.0'
					BOTTOM OF BORING 26.0'
30.0'					Note: 1. No sample recovery from 24' to 24.4'.
					2. Installed 26' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.
35.0'					
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA.

HOLE NO. B-23D

DATE STARTED 10/15/85 **COMPLETED** 10/18/85

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 18.0'

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 24.0'
25.0'					Run - 1 25.0' - 28.0' RQD = 0 Recovery 1.0' - 33% Cored Boulder from 25'-26' TOP OF ROCK 27.0'
30.0'					Run - 2 30.0' - 38.0' RQD = 65% Recovery 7.5' - 94% 38.0'
40.0'					Run - 3 38.0' - 47.5' RQD = 81% Recovery 9.7' - 102% 47.5'
50.0'					BOTTOM OF BORING 47.5'
					Note: 1. Coring time in rock averaged 6 to 10 min/ft; lost all water while drilling at 27.5'; never regained. 2. Rock type-Gray and pink, medium-grained GRANODIORITE. 3. Installed 47.5' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA.

HOLE NO. B-24S

DATE STARTED 10/1/85 **COMPLETED** 10/2/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		5-8	1	0-2'	Light brown, dry, medium dense, fine SAND, SILT, and fine GRAVEL 2.0'
		12-8			
		41-25	2	2'-4'	
		20-60			
5.0'		52-77	3	4'-5.2'	Light brown, dry, very dense fine to medium SAND, and coarse to fine GRAVEL, COBBLES, little silt 7.0'
		100/.2			
		75/0		6'	
		75/0		8'	
10.0'					Light brown, moist, very dense fine to medium SAND, little embedded fine to coarse gravel, little silt 14.0'
		43-48	4	10'-12'	
		44-34			
15.0'					Light brown and gray, moist, very dense fine SAND and SILT, little embedded fine to coarse gravel
		66-67	5	15'-16.5'	
		95			
20.0'					
		23-33	6	20'-22'	
		44-61			
25.0'					
		65-110	7	25'-26'	26.0'
					Drilled with roller bit to 27.0'
					BOTTOM OF BORING 27.0'
30.0'					Note: 1. Hole too crooked to core.
					2. Installed 28.5' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA. **HOLE NO.** B-24D

DATE STARTED 10/2/85 **COMPLETED** 10/7/85 **SURF. ELEV.**

GROUND WATER DEPTH AFTER 72 HOURS - 12.5' **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to top of weathered rock at 23.0'
					TOP OF ROCK @ 23.0'
25.0'					Run - 1 27.5' - 31.5' RQD=0%
					Recovery 2.7' - 68%
					31.5'
30.0'					Run - 2 31.5' - 41.5' RQD=75%
					Recovery 10.0' - 100%
					41.5'
35.0'					Run - 3 41.5' - 47.5' RQD=37%
					Recovery 5.4' - 90%
					47.5'
40.0'					BOTTOM OF BORING 47.5'
					Note: 1. Coring time in rock averaged 8 to 12 min./ft.; no water loss.
45.0'					2. Rock Type- Gray, medium grained GRANODIORITE with ocassional quartz stringers.
50.0'					3. Installed 49' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA. **HOLE NO.** B-25S

DATE STARTED 10/2/85 **COMPLETED** 10/4/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH HOLLOW STEM AUGER CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		11	1	.5'-2'	ASPHALT .4'
		13-8			
		4-2	2	2'-4'	Brown, dry, medium-dense to loose, fine SAND and SILT, trace fine to medium gravel
		5-7			
5.0'		4-4	3	4'-6'	6.0'
		2-2			
		11-13	4	6'-8'	Light gray, moist, medium-dense, fine SAND and SILT, some embedded fine to medium gravel 8.0'
		5-5			
		5-11	5	8'-10'	
10.0'		17-21			
		20-21	6	10'-12'	Olive-brown, moist, dense to very dense SILT, little embedded fine to coarse gravel, trace embedded fine to medium sand
		21-24			
		17-38	7	12'-14'	
		42-48			
15.0'		20-18	8	14'-16'	16.0'
		18-21			
		28-34	9	16'-18'	Olive-brown, wet, very dense SILT, little embedded fine to coarse gravel, little embedded fine to medium sand
		44-58			
		13-28	10	18'-20'	
20.0'		39-51			
		10-39	11	20'-22'	24.0'
		40-55			
25.0'					Brown-gray, moist, hard SILT, trace clay (finely layered) 26.0'
		18-18	12	25'-27'	Brown-gray, moist, very dense SILT, little embedded fine to medium gravel, trace embedded fine sand
		20-40			
30.0'					Refusal @ 31.0'
		75/.4	13	30'-30.4'	BOTTOM OF BORING. 31.0'
					Note; Installed 30.5' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.
35.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA.

HOLE NO. B-25D

DATE STARTED 10/4/85 **COMPLETED** 10/11/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to rock at 27.0'
					TOP OF ROCK @ 27.0'
30.0'					Run - 1 27.5' - 34.4' RQD=61%
					Recovery 6.8' - 99%
					34.4'
					Run - 2 34.4' - 44.4' RQD=74%
35.0'					Recovery 9.7' - 97%
					44.4'
					Run - 3 44.4' - 48.0' RQD=87%
40.0'					Recovery 3.8' - 106%
					48.0'
					BOTTOM OF BORING 48.0'
45.0'					Note: 1. Coring time in rock averaged 3-5 min./ft.; no water loss.
					2. Rock type- Pink and gray, medium to coarse grained GRANITE PEGMATITE
50.0'					3. Installed 47.5' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

CON–TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA.

HOLE NO. B-26S

DATE STARTED 9/19/85 **COMPLETED** 9/19/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH HOLLOW STEM AUGER CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal at 22.6'
					TOP OF ROCK 22.6'
					BOTTOM OF BORING 22.6'
					Note: Installed 23.9' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-26D

DATE STARTED 9/12/85 **COMPLETED** 9/18/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		2-6	1	0-2'	Light brown, dry, medium dense, medium to fine SAND, some coarse to fine gravel, cobbles
		11-11			
		75/0		2'-	
5.0'		34-38	2	4'-5.5'	
		75			
		75/0		6'-	7.5'
					Green-gray, moist, dense SILT, little embedded fine to medium gravel, trace embedded fine to medium sand
		13-12	3	8'-10'	
10.0'		18-23			
		23-28	4	10'-12'	
		21-18			
		10-17	5	12'-14'	
		23-28			
15.0'		7-11	6	14'-16'	
		16-18			
		15-26	7	16'-18'	
		33-30			
		21-28	8	18'-20'	
20.0'		30-42			
		14-16	9	20'-22'	
		15-11			TOP OF ROCK 23.0'
					Run - 1 22.3' - 25.3' RQD=0%
					Recovery 2.0' - 100% 25.3'
25.0'					
					Run - 2 25.3' - 30.0' RQD=36%
					Recovery 4.4' - 88% 30.3'
30.0'					
					Run - 3 30.3' - 36.0' RQD=44%
					Recovery 5.1' - 89% 36.0'
35.0'					Run - 4 36.0' - 42.3' RQD=73%
					Recovery 4.6' - 73%
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** 26D

DATE STARTED 9/12/85 **COMPLETED** 9/18/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
45.0'					42.3'
					BOTTOM OF BORING
					Note: 1. Coring time in rock averaged 8 to 10 min./ft.; no water loss.
					2. Rock type- Gray, medium-grained, GRANODIORITE.
					3. Installed 40.4' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOUBRN, MA **HOLE NO.** 27S

DATE STARTED 9/30/85 **COMPLETED** 9/30/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

SHEET 1 **OF** 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to 22.0'
					Installed 23' of 2" PVC riser pipe in borehole; bottom 10' seciton is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-27D

DATE STARTED 9/19/85 **COMPLETED** 9/21/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING: NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		1-3	1	0-2'	Light brown, dry, medium dense to very dense, fine to medium SAND, SILT, and coarse to fine GRAVEL, COBBLES
		7-8			
		75/.1		2'-2.1'	
5.0'		75/.1		4'	5.0'
		17-21	2	5'-7'	Green-gray, moist, very dense SILT, little embedded fine to coarse gavel, cobbles, trace embedded fine to medium sand
		25-29			
		31-42	3	7'-9'	
		26-28			
10.0'		12-13	4	9'-11'	
		14-49			
		26-31	5	11'-13'	
		30-28			
		37-36	6	13'-15'	
15.0'		42-68			
		40-46	7	16'-18'	
		37-56			
		40	8	18.5'-20.5'	
20.0'		51-23			TOP OF ROCK 20.7'
		73-100/.2	9	20.5'-20.7'	Run - 1 21.3' - 26.3' RQD=80%
					Recovery 4.7' - 94% 26.3'
25.0'					Run - 2 26.3' - 29.0' RQD=74%
					Recovery 2.5' - 93% 29.0'
					Run - 3 29.0' - 34.5' RQD=73%
30.0'					Recovery 4.6' - 84% 34.5'
					Run - 4 34.5' - 40.5' RQD=100%
35.0'					Recovery 6.0' - 100%
40.0'					

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

HOLE NO. B-27D

DATE STARTED 9/19/85 **COMPLETED** 9/21/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					40.5'
					BOTTOM OF BORING 40.5'
45.0'					Note: 1. Coring time in rock averaged 8 to 12 min./ft.; no water loss.
					2. Rock type- Gray, medium-grained GRANODIORITE
					3. Installed 43' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET, WOBURN, MA.

HOLE NO. B-28S

DATE STARTED 9/25/85 **COMPLETED** 10/1/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Drilled without sampling to refusal @ 25.4' Installed 27.7' of 2" PVC riser pipe in borehole; bottom 10' section is slotted. Note: First attempt to drill hole could not get casing beyond boulder from 6' to 8' - Roller bit boulder 6'-7' Cored boulder 7'-8' Bottom of hole 8.0'

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

HOLE NO. B-28D

DATE STARTED 9/23/85 **COMPLETED** 9/25/85

SURF. ELEV.

GROUND WATER

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

BORING MADE WITH 4" CASING; NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		6-7	1	0-2'	ASPHALT .2'
		9-7			
		3-2	2	2'-4'	Light brown, dry, medium dense to loose, fine SAND, little silt,
		2-15			
5.0'		17-23	3	4'-6'	trace fine gravel 3.5'
		28-24			
		33-40	4	6'-8'	Light brown, dry, dense to very dense, fine to medium SAND, some
		27-57			
		55-66	5	8'-10'	fine to coarse gravel, cobbles, trace silt
10.0'		34-37			
		21-19	6	10'-11.8'	12.0'
		44-88/.3			
		36-78/.3	7	12'-12.8'	Brown-gray, moist, very dense, SILT and fine to medium SAND,
15.0'		15-23	8	14'-16'	little embedded fine to coarse gravel, cobbles
		21-21			
		18-23	9	16'-18'	
		61-16			
		13-23	10	18'-20'	
20.0'		33-25			
		19-21	11	20'-22'	TOP OF ROCK @ 25.0'
		30-28			Run - 1 25.0' - 29.5' RQD-57%
					Recovery 3.6' - 80% 29.5'
25.0'					Run - 2 29.5' - 30.5' RQD-75%
					Recovery 1.5' - 150% 30.5'
					Run - 3 30.5' - 35.5' RQD-37%
30.0'					Recovery 5.0' - 100% 35.5'
					Run - 4 35.5' - 39.5' RQD-18%
35.0'					Recovery 3.5' - 87% 39.5'
					Run - 5 39.5' - 41.7' RQD-76%
40.0'					Recovery 2.3' - 105% 41.7'

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA **HOLE NO.** B-28D

DATE STARTED 9/23/85 **COMPLETED** 9/25/85 **SURF. ELEV.**

GROUND WATER **JOB NO.** 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE **CASING 12" W/300 LB. WEIGHT FALLING 24"**

NX CORE

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					Run - 6 41.7' - 44.5' RQD-48%
					Recovery 2.5' - 89% 44.5'
45.0'					BOTTOM OF BORING 44.5'

Note:
1. Coring time in rock averaged 8 to 12 min./ft.; some water loss.
2. Rock type- Gray, slightly to very broken, coarse to fine grained GRANODIORITE with occasional quartz stringers.
3. Installed 45.4' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.

W. R. GRACE CO. - CRYOVAC DIVISION

WASHINGTON STREET, WOBURN, MA.

WELL CONSTRUCTION DETAILS

WELL#	PVC SCREEN	FILTER SAND	GROUT SEAL	PVC STICKUP
13S	17'-27'	14'-27.5'	0-14'	2.5'
13D	37'-52'	29'-52.2'	0-29'	3.5'
14S	11.8'-21.8'	9'-22'	0-9'	3.3'
14D	27.7'-42.7'	24'-42.7'	0-24'	2.7'
15S	13.8'-23.8'	10'-24.5'	0-10'	-.3'
15D	31.5'-46.5'	26'-46.5'	0-26'	-.3'
16S	20.1'-30.1'	15'-30.5'	0-15'	-.3'
16D	44.3'-59.3'	40'-60'	0-40'	-.3'
17S	37.2'-47.2'	30'-49.4'	0-30'	-.3'
17D	57'-72'	50'-72'	0-50'	-.3'
18S	21.8'-31.8'	18'-33.2'	0-18'	-.3'
18D	37'-52'	35'-53'	0-35'	-.3'
19S	10'-20'	6'-21'	0-6'	-.3'
19M	34.5'-44.5'	30'-52'	0-30'	-.3'
19D	58.8'-73.8'	56'-75'	0-56'	-.3'
20S	25'-35'	20'-35'	0-20'	-.3'
20M	48.4'-58.4'	44'-63.5'	0-44'	-.3'
20D	70'-85'	64'-85'	0-64'	-.3'
21S	18.9'-28.9'	15'-29'	0-15'	1.5'
21D	33'-48'	30'-49.5'	0-30'	2.0'
22S	17.4'-32.4'	14'-33'	0-14'	2.4'
22D	36.9'-51.9'	34.5'-52.8'	0-34.5'	.8'
23S	16'-26'	12'-26'	0-12'	-.3'
23D	32.5'-47.5'	29'-47.5'	0-29'	-.3'
24S	16'-26'	11'-26'	0-11'	2.5'
24D	32'-47'	28'-47.5'	0-28'	2.0'
25S	20.1'-30.1'	15'-30.4'	0-15'	-.3'
25D	32.5'-47.5'	28'-48'	0-28	-.3'
26S	11'-21'	6'-22.6'	0-6'	2.9'
26D	25'-40'	23'-42.3'	0-23'	.5'
27S	11.2'-21.2'	8.5'-22'	0-8.5'	1.8'
27D	25.5'-40.5'	23'-40.5'	0-23'	2.5'
28S	14.6'-24.6'	12'-25.4'	0-12'	3.4'
28D	29.5'-44.5'	27'-44.5'	0-27'	.9'

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

DATE STARTED 1/9/86 COMPLETED 1/10/86

GROUND WATER DEPTH ON COMPLETION - 2.4'

HOLE NO. 29S

SURF. ELEV.

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH
		81	1	.5'-1'
		14-19	2	2'-3.9'
		24-75/.4		
5.0'		18-26	3	4'-6'
		33-39		
		29-33	4	6'-8'
		36-40		
		26-34	5	8'-9.4'
10.0'		75/.4		
		75/.4	6	10'-10.4'
		58-75/.3	7	12'-12.8'
15.0'		58-91	8	14'-15'
		68-118	9	16'-17'
		61-84	10	18'-19'
20.0'				
		54-75/.3	11	20'-20.8'
25.0'				
		49-82	12	25'-26'
30.0'				

DESCRIPTION OF MATERIAL	
ASPHALT	.3'
Light brown, very dense, fine to coarse SAND, some fine to medium gravel	.9'
Olive-brown, moist, very dense SILT, some fine sand, little embedded fine to coarse gravel	8.0'
Olive-gray, moist, very dense SILT, little embedded fine to coarse gravel, little embedded fine sand	12.2'
Light brown, wet, very dense, fine to medium SAND and coarse to fine GRAVEL, COBBLES, trace silt Hole caving from 12'-15.5'.	15.5'
Olive-gray, wet, very dense, fine to medium SAND, some embedded fine to coarse gravel, little to trace silt	26.0'
BOTTOM OF BORING	26.0'

Note: Installed 24.3' of 2" PVC riser pipe in bore-hole; bottom 15' section is slotted.

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA — HOLE NO. 30S

DATE STARTED 1/23/86 . COMPLETED 1/23/86 — SURF. ELEV.

GROUND WATER DRY ON COMPLETION — JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH HOLLOW STEM AUGER CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					TOPSOIL .3'
		17-75/.4	1	2'-2.9'	Olive-brown, dry, very dense SILT and coarse to fine GRAVEL, COBBLES, trace embedded fine to medium sand 3.0'
5.0'					
					GAS LINE 3.4'
10.0'					BOTTOM OF BORING 3.4'

Note: Made three attempts to drill B-30S

#1 - Refusal @ 4.2'

#2 - Refusal @ 4.0'

#3 - Abandoned hole due to gas line in area

TEST BORING LOG

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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA — HOLE NO. 32S

DATE STARTED 1/21/86 . COMPLETED 1/21/86 — SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 6.5' — JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

SHEET 1 OF 1

BORING MADE WITH 4" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		26-49	1	3'-5'	COBBLES and fine to coarse GRAVEL
5.0'		55-53			Light brown, dry, coarse to fine GRAVEL, COBBLES, and medium to fine SAND 7.0'
		55-75/.2	2	5'-5.7'	
		10-10	3	7'-9'	Olive-brown, wet, medium dense to very dense SILT, some fine sand, little embedded fine to coarse gravel
		11-17			
10.0'		17-21	4	9'-11'	13.0'
		25-23			
		15-16	5	11'-13'	Olive-brown, wet, very dense SILT, little fine to medium sand, little embedded fine to coarse gravel, cobbles
		17-25			
		9-13	6	13'-15'	
15.0'		15-30			
		33-75/.3	7	15'-15.8'	
		24-18	8	17'-19'	
		18-31			
20.0'		30-39	9	19'-21'	
		48-21			
25.0'					TOP OF ROCK 25.0'
					Drilled with Roller Bit 26.0'
					BOTTOM OF BORING 26.0'
30.0'					Note: Installed 27' of 2" PVC riser pipe in borehole; bottom 10' section is slotted.

TEST BORING LOG

CON–TEC., INC.
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PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

HOLE NO. 31D

DATE STARTED 1/13/86 . COMPLETED 1/17/86

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 6.2'

JOB NO. 8563

N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

BORING MADE WITH 4" + 3" CASING

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
		6-6	1	0-2'	TOPSOIL .3'
		12-24			
		75/.2		2'-2.2'	Light brown, moist, dense to very dense, fine SAND and SILT, little embedded fine to coarse gravel, occasional cobbles
5.0'		16-17	2	4'-6'	
		24-28			
		75/.3		6'-6.3'	
		32-34	3	7'-8'	
		24-27	4	8'-10'	8.0'
10.0'		34-44			Light brown, wet, very dense, fine to medium SAND, little embedded fine to coarse gravel, trace silt 10.0'
		32-51	5	10'-11.3'	
		75/.3			
		21-42	6	12'-14'	Olive-gray, moist, very dense SILT, some fine sand, little embedded fine to coarse gravel
		44-57			
15.0'		29-39	7	14'-15.8'	
		46-75/.3			COBBLES- 16'-18'
		50/0		16'-	
		30-31	8	18'-19.6'	
20.0'		52-75/.1			
		96	9	20'-20.5'	BOULDER - 23.7'-25.7' 23.7'
25.0'					Run - 1 24.2' - 27.8'
					Recovery 1.8' - 50%
					BOULDERS
30.0'					TOP OF ROCK @ 27.8'
					Run - 2 27.8' - 33.0' RQD-92%
					Recovery 5.2' - 100% 33.0'
35.0'					Run - 3 33.0' - 43.0' RQD-99%
					Recovery 9.9' - 99%

TEST BORING LOG

CON-TEC., INC.
P.O. BOX 1153
CONCORD, N.H. 03301
603-224-0020

PROJECT W.R. GRACE CO. - CRYOVAC DIVISION

LOCATION WASHINGTON STREET - WOBURN, MA

HOLE NO. 31D

DATE STARTED 1/13/86 . COMPLETED

SURF. ELEV.

GROUND WATER DEPTH ON COMPLETION - 6.2'

JOB NO. 8563

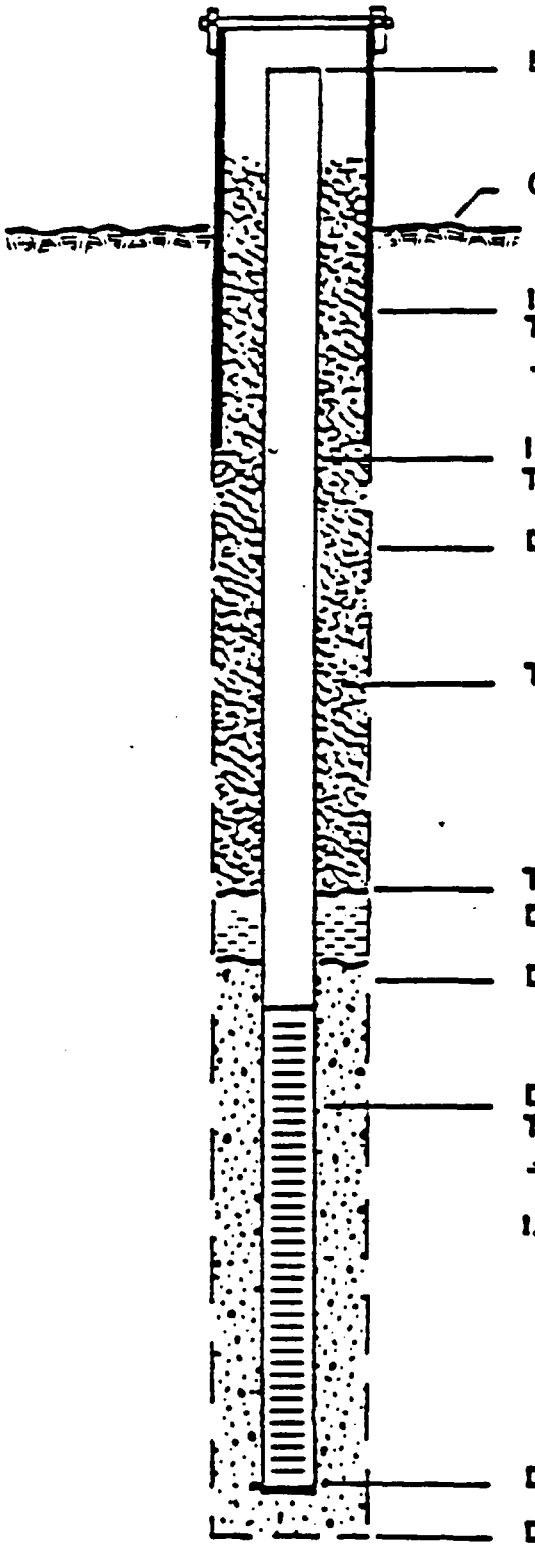
N-NO OF BLOWS TO DRIVE 2" SAMPLER 6" W/140 LB. WEIGHT FALLING 30"

C-NO. OF BLOWS TO DRIVE CASING 12" W/300 LB. WEIGHT FALLING 24"

NX Core

DEPTH	C.	N.	SPL. NO.	SAMPLE DEPTH	DESCRIPTION OF MATERIAL
					43.0'
45.0'					Run - 4 43.0' - 48.0' RQD-82% Recovery 5.0' - 100%
50.0'					48.0'
					BOTTOM OF BORING 48.0'

Note:
1. Coring time in rock averaged 3 to 5 min./ft.; no water lost.
2. Rock Type- Gray and pink GRANODIORITE
3. Installed 50.5' of 1½" PVC riser pipe in borehole; bottom 15' section is slotted.



Elevation of top of riser pipe 47.17 ft.

Ground Elevation 45.0 ft.

I.D. of surface casing 3"
Type of surface casing Steel with locking cap

I.D. of riser pipe 2"
Type of riser pipe Schedule 40 Flush joint PVC

Diameter of borehole 4"

Type of backfill Cement grout to 5 ft.
In situ sediment to 28 ft.

Type of seal Bentonite Pellets
Depth to top of seal 28 ft.

Depth to top of sand pack 29.9 ft.

Depth to top of screen 32.8 ft.
Type of screened section .010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 42.8 ft.

Depth of borehole 44.5 ft.

REPORT OF MONITORING WELL W-1

DRAWN BY: LGR	CHECKED BY:	PROJECT NO: 82C2467	DATE 9/26/83	FIGURE NO

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG of BORING No. W-1

DATE 8/18/83 SURFACE ELEVATION 45.0 LOCATION See Plate

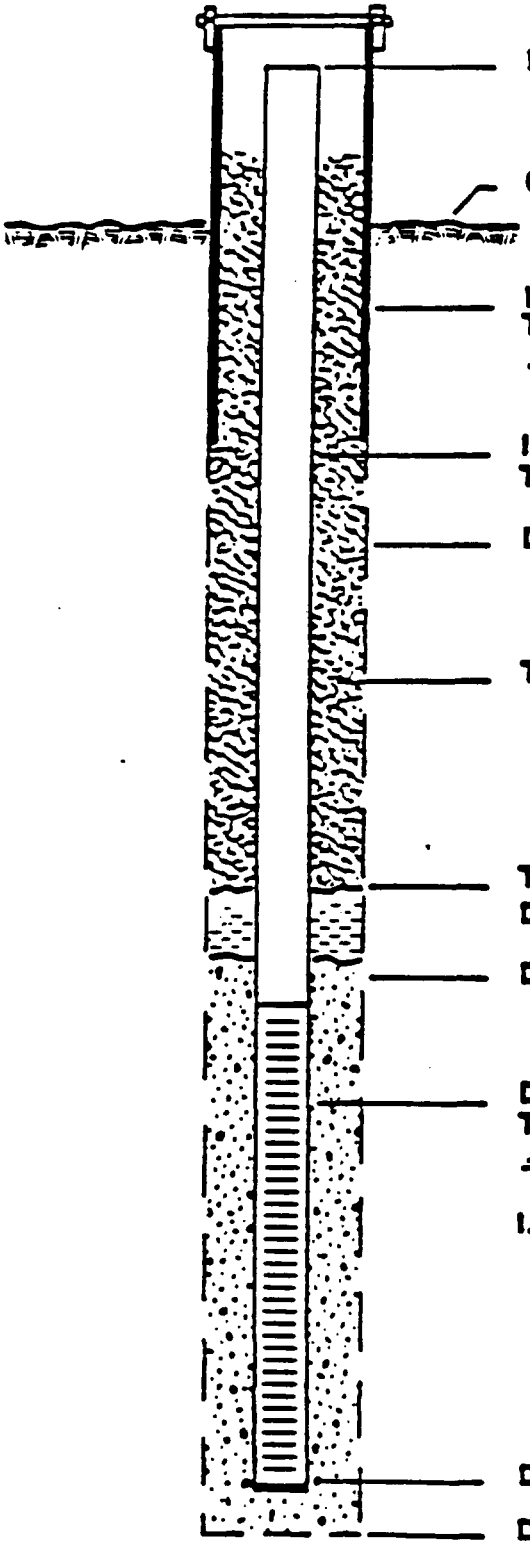
DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE (1)	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0		2	Brown to tan fine Sand, trace of gravel, trace of of organics (FILL)		1
5		2			200
		3 (2)	- becoming black		300
				35.0	
10		30 (3)	Brown fine Sand, trace of mica		12
		16			3
15		12	- becoming gray with trace of medium Sand and trace of silt.		< 1
20		19			8
25		26			90
30		40	- red-brown fine sand seams		65
35		27		9.0	3
			Grey gravelly coarse to medium Sand, trace of mica		
40		30			-
		-			3
45				.5	

(1) 3½-inch O.D. split spoon sampler driven with 300-lb. hammer.
(2) Offset approximately 4 feet east of original borehole due to obstruction.
(3) Second offset approximately 20 feet east of original borehole.

Completion Depth 44.5 Feet Water Depth 2.64 Feet Date 11/17/83

Project Name BEATRICE Project Number 82 C 2467

Woodward-Clyde Consultants



Elevation of top of riser pipe: 47.64 ft.

Ground Elevation: 45.1 ft.

I.D. of surface casing: 3"

Type of surface casing: Steel with locking cap

I.D. of riser pipe: 2"

Type of riser pipe: Schedule 40 Flush joint PVC

Diameter of borehole: 4"

Type of backfill: Cement grout to 5 ft.
In situ sediment to 19 ft.

Type of seal: Bentonite Pellets

Depth to top of seal: 19 ft.

Depth to top of sand pack: 21 ft.

Depth to top of screen: 25 ft.

Type of screened section: .010" slotted schedule 40 PVC

I.D. of screened section: 2"

Depth to bottom of well: 35 ft.

Depth of borehole: 37 ft.

REPORT OF MONITORING WELL SW-1

DRAWN BY: LGR	CHECKED BY:	PROJECT NO: 82C2467	DATE: 9/26/83	FIGURE NO

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTIST

LOG of BORING No. SW-1

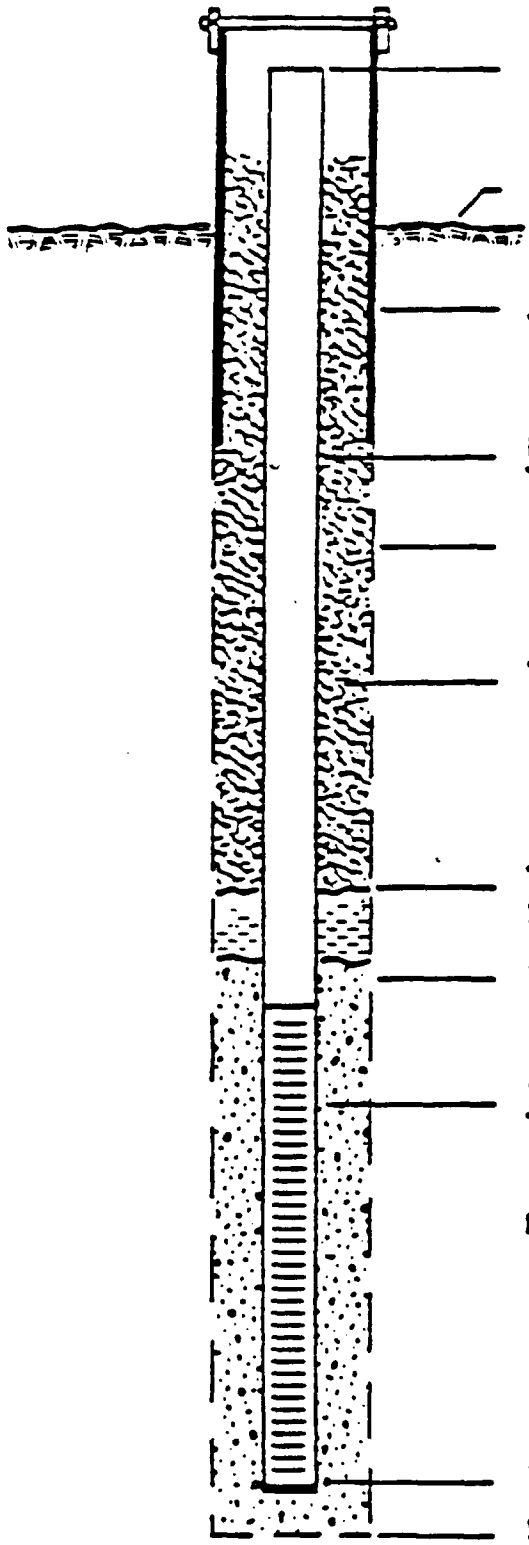
DATE 8/31/83 SURFACE ELEVATION 45.1 LOCATION See Plate

DEPTH, ft.	SAMPLES	SAMPLING (1) RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0			(See log of W-1 for 0-25 feet)		
25				20.1	
25			Tan to orange fine Sand with silt seams		2.5
30			- trace of oxides	11.6	7
35			Tan coarse to fine Sand, trace of gravel	8.1	4
			(1) 3½-inch O.D. split spoon sampler driven with 300-lb hammer.		

Completion Depth 37 Feet Water Depth 3.11 Feet Date 11/17/83

Project Name BEATRICE Project Number 82 C 2467

Woodward-Clyde Consultants



Elevation of top of riser pipe 46.6 ft.

Ground Elevation 44.1 ft.

I.D. of surface casing 3"
Type of surface casing Steel
with locking cap

I.D. of riser pipe 2"
Type of riser pipe Schedule 40 Flushjoint PVC

Diameter of borehole 4"

Type of backfill Cement grout to 5 ft.
In situ sediment to 29.8 ft.

Type of seal Bentonite Pellets
Depth to top of seal 29.8 ft.

Depth to top of sand pack 31.8 ft.

Depth to top of screen 34.5 ft.
Type of screened section
.010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 44.5 ft.

Depth of borehole 47 ft.

REPORT OF MONITORING WELL W-2

DRAWN BY	CHECKED BY	PROJECT NO 82C2467	DATE 9/26/83	FIGURE NO

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTIST

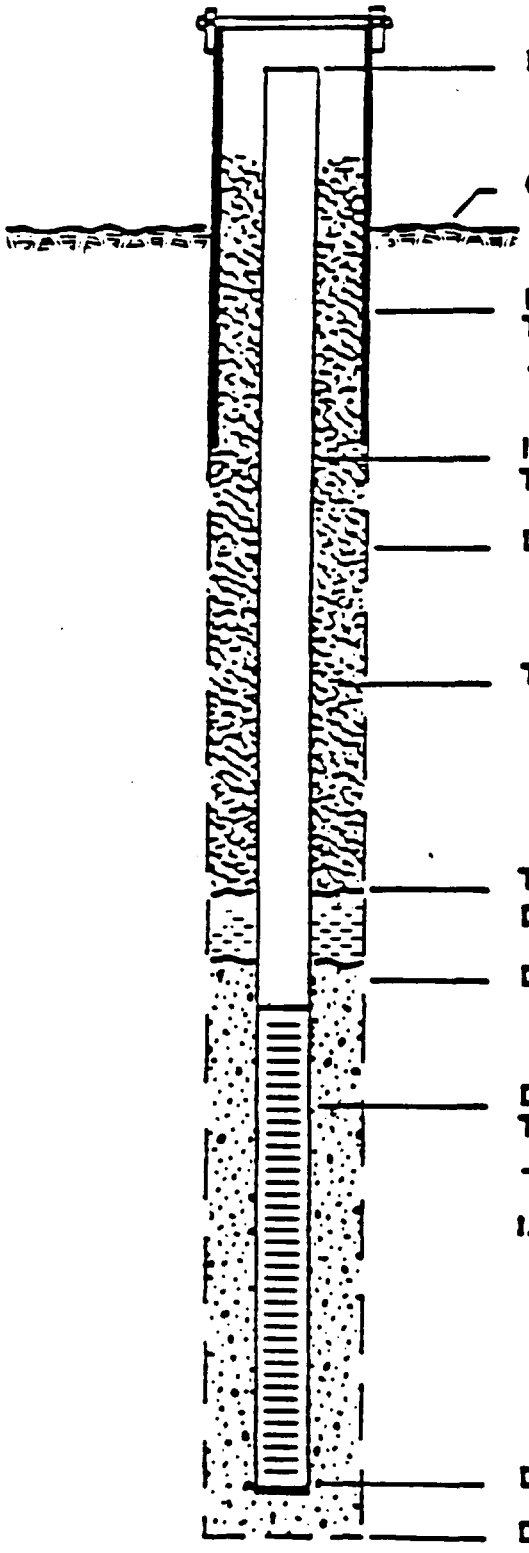
LOG of BORING No. W-2

DATE 8/19/83 SURFACE ELEVATION 44.1 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0		3	Black organic, silty, fine Sand	37.6	<1
5		19	Grey to tan medium to fine Sand, trace of mica		<1
10		13			<1
15		9			<1
20		14			<1
25		25		15.6	<1
30		25	Brown coarse to medium sandy Gravel		1
35		42			1
40		52			ND
45		14	(1) 3½-inch O.D. split spoon sampler driven with 300-lb hammer	-2.9	1

Completion Depth 47 Feet Water Depth 5.27 Feet Date 11/17/83

Project Name BEATRICE Project Number 82 C 2467



Elevation of top of riser pipe 47.56 ft.

Ground Elevation 45.1 ft.

I.D. of surface casing 2.5"
Type of surface casing Steel with locking cap

I.D. of riser pipe 2"
Type of riser pipe Schedule 40 flush joint PVC

Diameter of borehole 4"

Type of backfill Cement grout to 5 ft.
In situ sediment to 10 ft.

Type of seal Bentontie Pellets
Depth to top of seal 5.1 ft.

Depth to top of sand pack 7.5 ft.

Depth to top of screen 10.0 ft.
Type of screened section .010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 20 ft.

Depth of borehole 20 ft.

REPORT OF MONITORING WELL **SW-2**

DRAWN BY: LGR	CHECKED BY:	PROJECT NO: 82C2467	DATE: 9/26/83	FIGURE NO

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG of BORING No. SW .

DATE 8/30/83 SURFACE ELEVATION 45.1 LOCATION See Plate

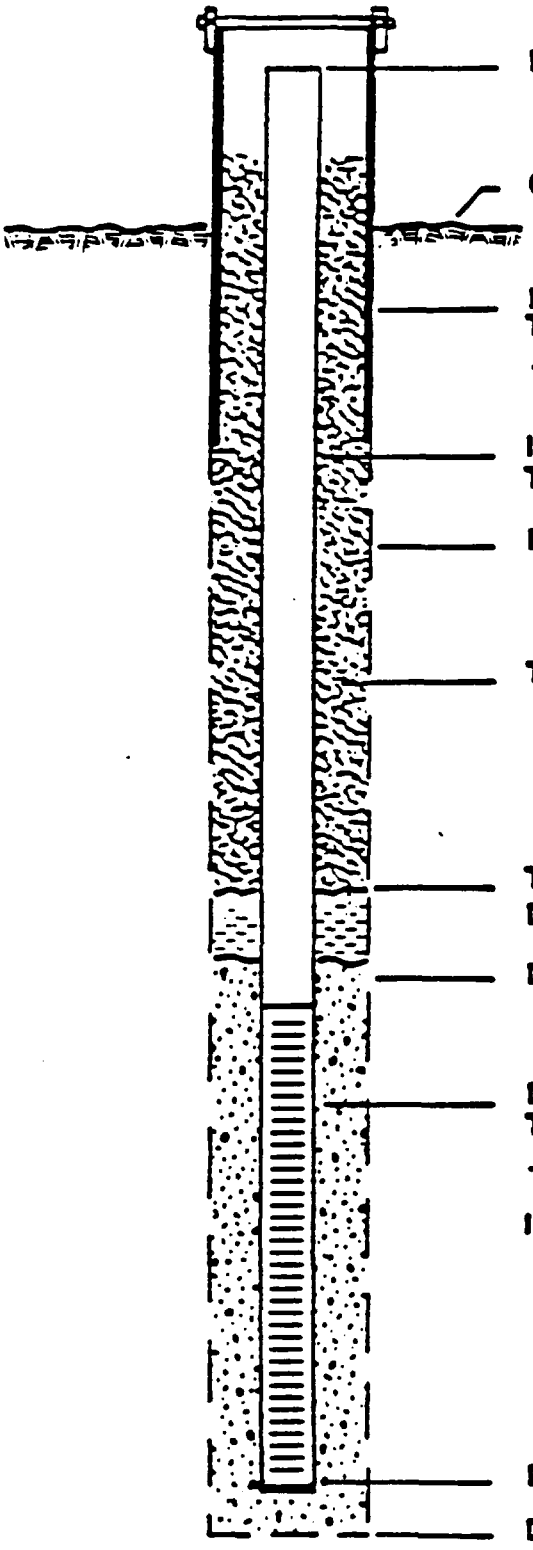
DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0					
		23	Tan fine Sand, trace of mica		< 1
5		30			< 1
		18	- with medium Sand		< 1
10		11			< 1
15		10			< 1
20		8	- trace of gravel	23.1	< 1

(1) 3-1/2 inch O.D. split spoon sampler driven with 300 lb. hammer

Completion Depth 20 Feet Water Depth 4.42 Feet Date 11/17/83

Project Name BEATRICE Project Number 82 C 2467

Woodward-Clyde Consultants



Elevation of top of riser pipe 47.14 ft.

Ground Elevation 45 ft.

I.D. of surface casing 3"
Type of surface casing Steel with locking cap

I.D. of riser pipe 2"
Type of riser pipe Schedule 40 flush joint PVC

Diameter of borehole 4"

Type of backfill Cement grout to 5 ft.
In situ sediment to 27.3 ft.

Type of seal Bentonite Pellets
Depth to top of seal 27.3 ft.

Depth to top of sand pack 30.3 ft.

Depth to top of screen 33.8 ft.
Type of screened section .010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 43.8 ft.

Depth of borehole 47 ft.

REPORT OF MONITORING WELL W-3

DRAWN BY	CHECKED BY	PROJECT NO	DATE	FIGURE NO
LGR		82C2467	9/26/83	

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG of BORING No. W-3

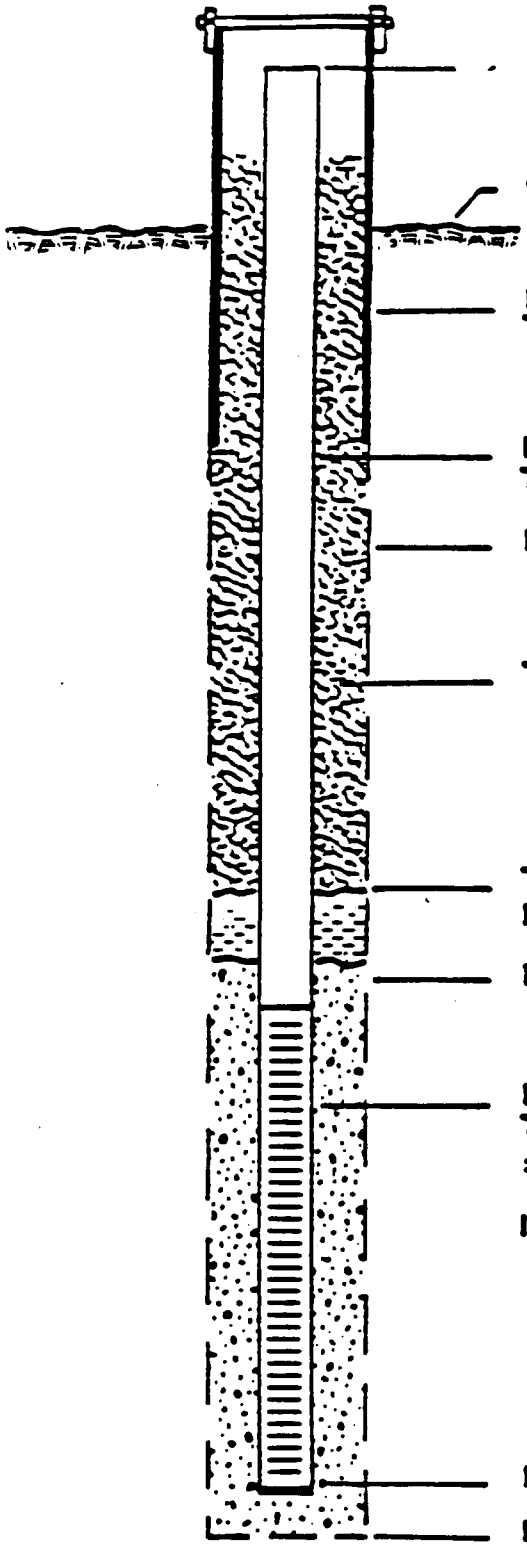
DATE 8/26/83 SURFACE ELEVATION 45.0 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
5		38	Brown fine Sand, trace of silt, trace of mica		1.5
10		13			< 1
15		20	- becoming grey with trace of medium Sand		ND
20		8			2
25		20		16.5	-
30		20	Grey coarse to fine sandy Gravel, trace of mica		1
35		14			-
40		50			< 1
45		23	(1) 3½-inch O.D. split spoon sampler driven with 300-lb. hammer.	-2.0	1

Completion Depth 47 Feet Water Depth 8.66 Feet Date 11/17/83

Project Name BEATRICE Project Number 82 C 2467

Woodward-Clyde Consultants



Elevation of top of riser p. . . 45.88 ft.

Ground Elevation 43.2 ft.

I.D. of surface casing 3"
Type of surface casing Steel with locking cap

I.D. of riser pipe 2"
Type of riser pipe Schedule 40 flush joint PVC

Diameter of borehole 4"

Type of backfill Cement grout to 5 ft.
In situ sediment to 27.5 ft.

Type of seal Bentonite Pellets
Depth to top of seal 27.5 ft.

Depth to top of sand pack 30 ft.

Depth to top of screen 32 ft.
Type of screened section .010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 42 ft.

Depth of borehole 45 ft.

REPORT OF MONITORING WELL W-4

DRAWN BY	CHECKED BY	PROJECT NO	DATE	FIGURE NO
LGR		82C2467	9/26/83	

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG of BORING No. W-4

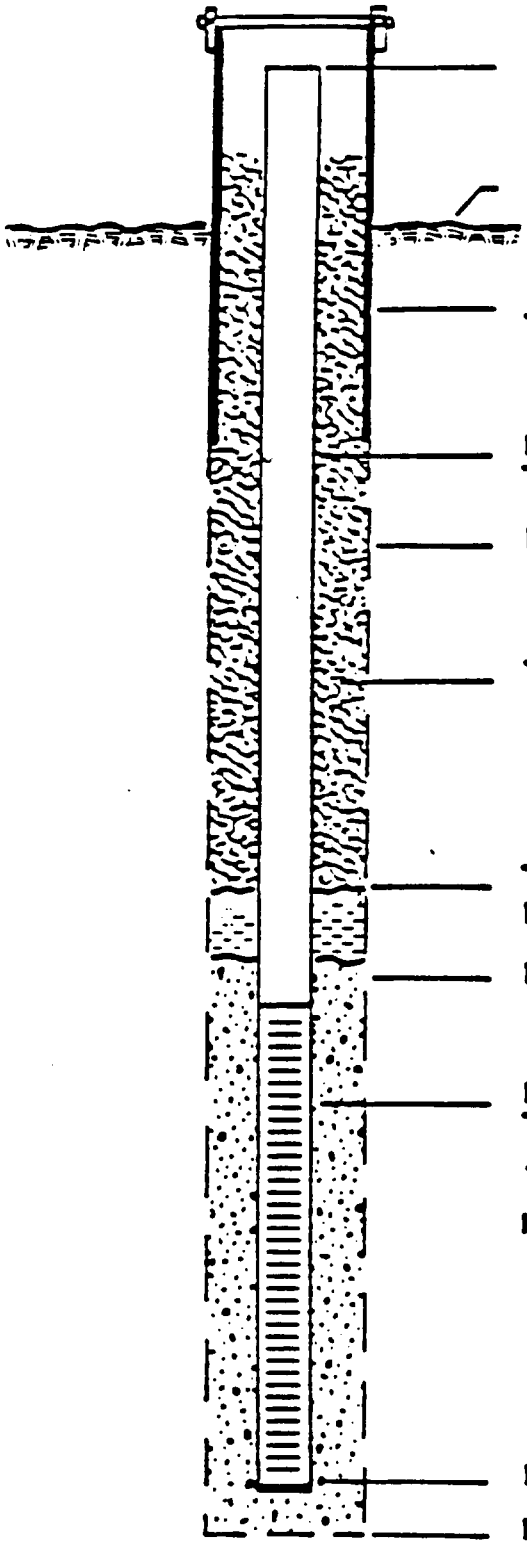
DATE 8/25/83 SURFACE ELEVATION 43.2 LOCATION See Plate

DEPTH, ft. / SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0				
5	35	Tan to grey medium to fine Sand, trace of mica, trace of organics.		1
10	11		29.7	<1
15	8	Tan to orange medium to fine Sand		<1
20	11			<1
25	15	- some coarse sand, trace of mica		1.5
30	33		11.2	<1
35	50	Tan to grey coarse to fine sandy Gravel trace of silt, trace of mica.		-
40	10 (2)	(1) 3½-inch O.D. split spoon sampler driven with 300-lb. hammer		<1
	100/0" (2)	(2) 2-inch O.D. split spoon sampler driven with 300-lb. hammer	-1.8	-
45				

Completion Depth 45 Feet Water Depth 2.97 Feet Date 11/17/83

Project Name BEATRICE Project Number 82C2467

Woodward-Clyde Consultants



Elevation of top of riser pipe 47.81 ft.

Ground Elevation 45.3 ft.

I.D. of surface casing 3"
Type of surface casing Steel with locking cap

I.D. of riser pipe 2"
Type of riser pipe Schedule 40 Flush joint PVC

Diameter of borehole 4"

Type of backfill Cement grout to 5 ft.
In situ sediment to 25 ft.

Type of seal Bentonite Pellets
Depth to top of seal 25 ft.

Depth to top of sand pack 27.7 ft.

Depth to top of screen 30 ft.
Type of screened section .010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 40 ft.

Depth of borehole 41 ft.

REPORT OF MONITORING WELL W-5

DRAWN BY	CHECKED BY	PROJECT NO	DATE	FIGURE NO
LGR		82C2467	9/26/83	

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG of BORING No. W-5

DATE 9/24/83 SURFACE ELEVATION 45.3 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0		14	Brown silty, gravelly fine Sand, trace of organics	42.8	1.5
5		87	Brown gravelly coarse to fine Sand		< 1
10		81			1.5
15		50/3"			-
20		45			< 1
25		80 (2)			< 1
30		88 (3)			1
35		60			1
40		150/6"		4.3	

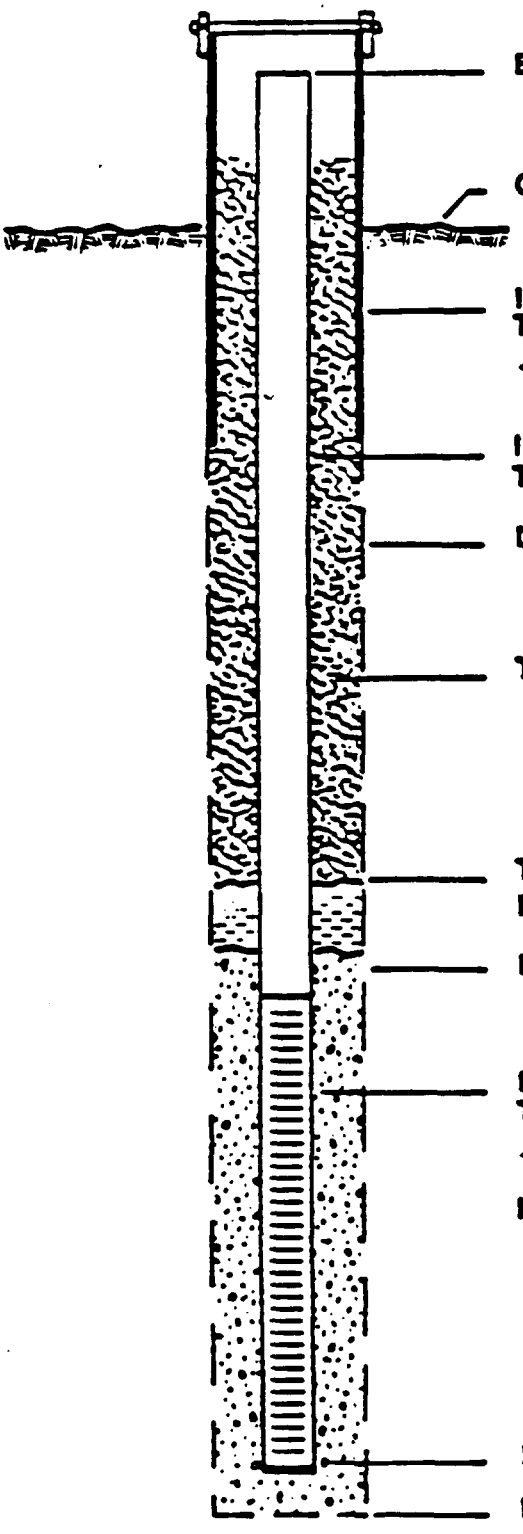
(1) 3½-inch O.D. split spoon sampler driven with 300-lb hammer.
(2) Sampled with drillers open ended "A" rod
(3) Offset approximately 30 feet south of original borehole

Completion Depth 41 Feet Water Depth 6.23 Feet Date 11/17/83

Project Name BEATRICE Project Number 82 C 2467

Woodward-Clyde Consultants

SSW-6



Elevation of top of riser pipe _____

Ground Elevation _____

I.D. of surface casing 3"
Type of surface casing steel with locking cap

I.D. of riser pipe 2"
Type of riser pipe schedule 40 flush joint PVC

Diameter of borehole 4"

Type of backfill cement grout

Type of seal Bentonite Pellets — Depth to top of seal 3.9'

Depth to top of sand pack 6.5'

Depth to top of screen 11.6'
Type of screened section .010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 16.4'

Depth of borehole 43.3'(a)

(a) Backfill: sand-pack from 20' to 6.5', in situ sediment below 20

REPORT OF MONITORING WELL SSW-6

DRAWN BY KRM	CHECKED BY	PROJECT NO 82C2467B	DATE 7-20-84	FIGURE NO

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG of BORING No. SW-6

DATE 7/17/84 SURFACE ELEVATION _____ LOCATION _____

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	OTHER TESTS (1)
0		2	Dark brown organic [illegible]					10
		14	Tan sil					520
10		23	Becomin					>1000
		23	Tan fin[illegible] sand, ti[illegible]					100
20		13	mica					40
		7						22
		19						28
30		19	Becoming [illegible]co fine sand, tr[illegible] ine gravel,					55
		10	trace of					25
40		71	Tan coarse to medium sand and coarse to fine gravel, trace of silt					43
		47						53
		137						10
50			Cobbles, boulders					
60			Granite Bedrock -NX Core -End of borehole					
70								
80			1. 3½-inch OD split spoon sampler driven with 300 lb. hammer.					
90			(1) OVA reading in ppm					

Scale error

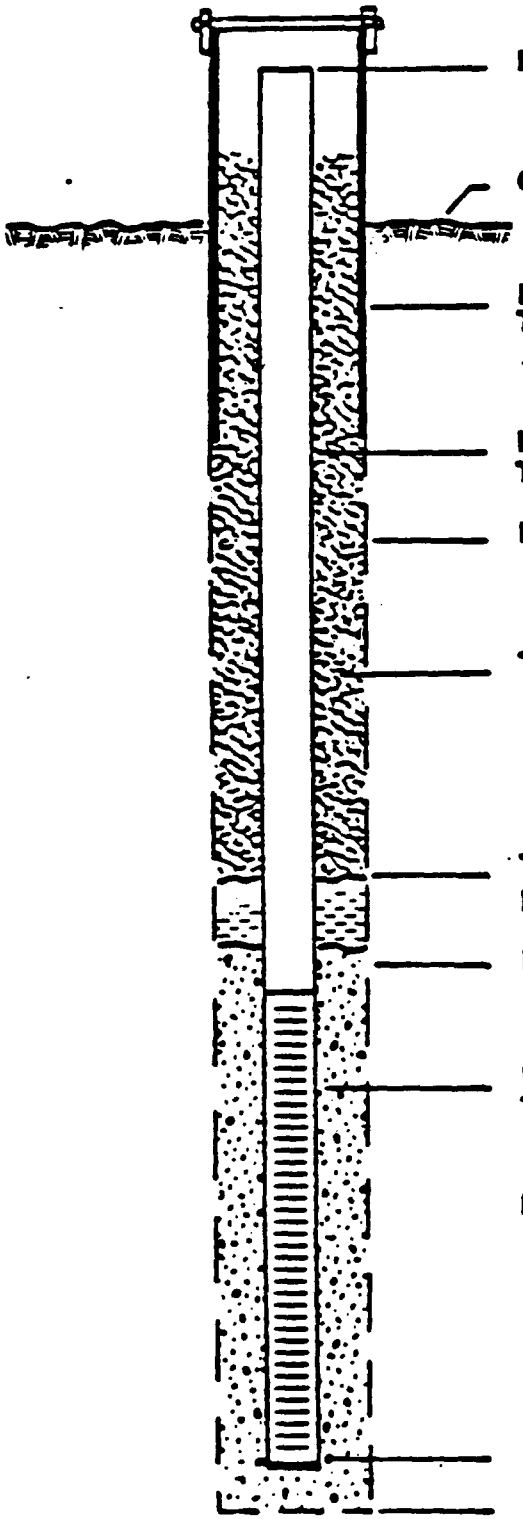
Completion Depth 32.5 Feet Water Depth 5' Feet Date 7-17-84

Project Name Beatrice Project Number 82C2467B

WCC-AP 1

Woodward-Clyde Consultants

SW-6



Elevation of top of riser pipe (+~2')

Ground Elevation

I.D. of surface casing 3"
Type of surface casing steel with locking cap

I.D. of riser pipe 2"
Type of riser pipe schedule 40 flush joint PVC

Diameter of borehole 4"

Type of backfill cement grout to 5 feet
In situ sediment to 15.7'

Type of seal Bentonite Pellets
Depth to top of seal 15.7'

Depth to top of sand pack 16.4'

Depth to top of screen 20.0'
Type of screened section .010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 24.8'

Depth of borehole 32.5'(a)

(a) Backfill: sand pack from 32.5' to 16.4'

REPORT OF MONITORING WELL SW-6

DRAWN BY: LGR	CHECKED BY:	PROJECT NO: 82C2467B	DATE 7/17/84	FIGURE NO

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG of BORING No. SSW-6

DATE 7/20/84 SURFACE ELEVATION _____ LOCATION _____

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	(1) OTHER TESTS
0			(see log of SW6 for 0-25 feet)					
10								
20								
30								
40			Scale ERROR ÷ 2					
50								
			N					
60								
			N					
70								
			NX					
80								
			NX					
			END OF BOREHOLE					
90								

(1) OVA reading in ppm

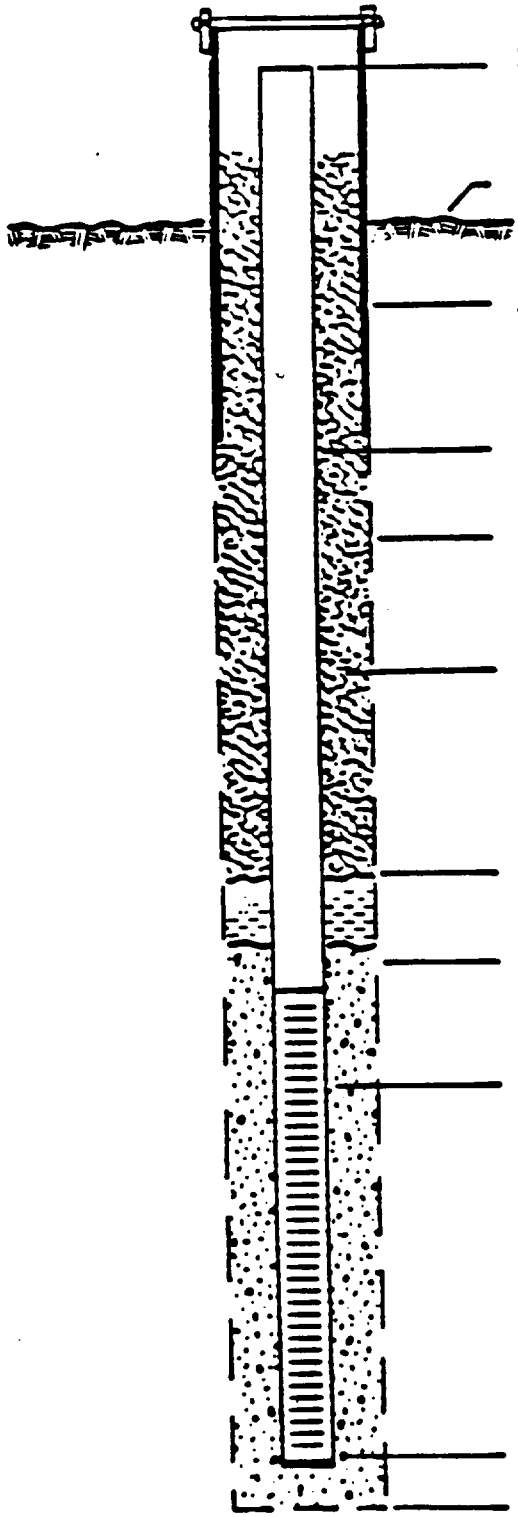
Completion Depth 43.3 Feet Water Depth 5 Feet Date 7/20/84

Project Name Beatrice Project Number 82C2467B

Woodward-Clyde Consultants

WCC-AP 1

SW-7



Elevation of top of riser pipe (~+1 ft)

Ground Elevation

I.D. of surface casing 3"
Type of surface casing steel
with locking cap

I.D. of riser pipe 2"
Type of riser pipe schedule 40 flush joint PVC

Diameter of borehole 4"

Type of backfill cement grout

Type of seal Bentonite Pellets
Depth to top of seal 2.5'

Depth to top of sand pack 6.7'

Depth to top of screen 9.0'
Type of screened section
.010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 13.8'

Depth of borehole 15.0'

REPORT OF MONITORING WELL SW-7

DRAWN BY: KRM	CHECKED BY: [illegible]	PROJECT NO: 82C2467B	DATE 7-24-84	FIGURE NO

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG of BORING No. SW-7

DATE 7-24 SURFACE ELEVATION _____ LOCATION _____

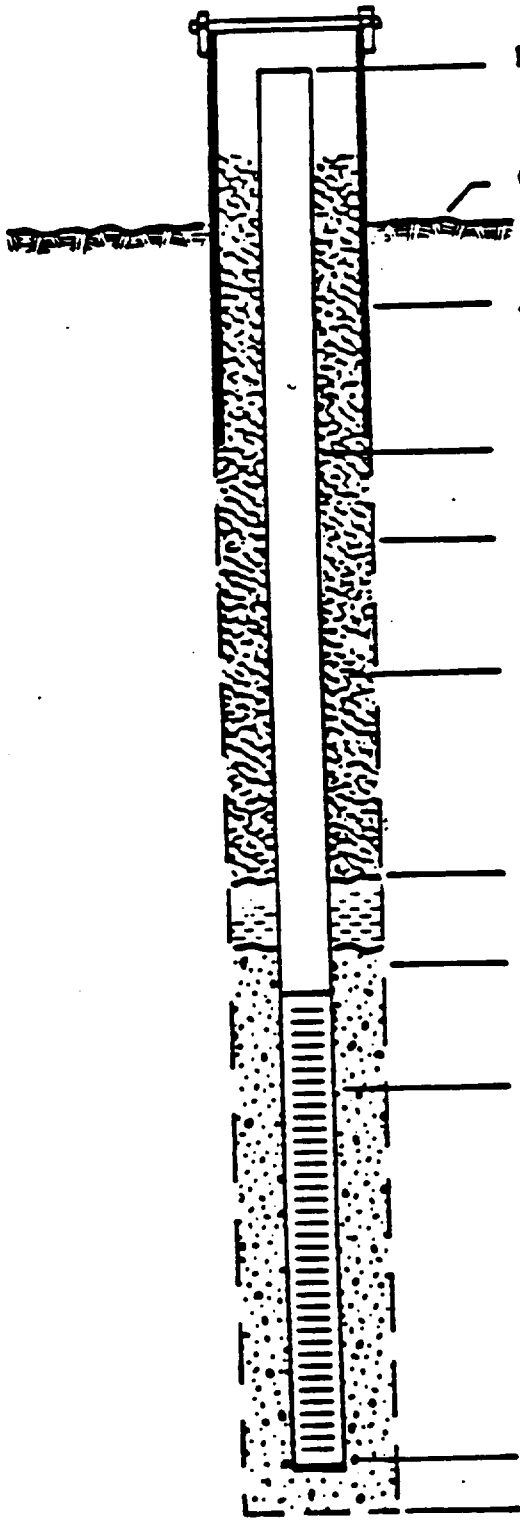
DEPTH, ft. / SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	(1) OTHER TESTS
0		Dark Brown organic silty medium to fine sand					
10		Brown medium to fine sand, trace of organics, trace of silt.					
20	4	becoming tan-grey medium to fine sand, trace of silt,					5
30	5						30
40							
50							
60							
70		1. 3½-inch OD split spoon sampler driven with 300 lb. hammer.					
80							
90		(1) OVA reading in ppm					

Completion Depth 15 Fee: Water Depth 2 Feet Date 7-24-84

Project Name Beatrice Project Number 82C2467B

WCC-RP1

Woodward-Clyde Consultants



Elevation of top of riser pipe (~+3½ inches)

Ground Elevation

I.D. of surface casing 3"
Type of surface casing steel with locking cap

I.D. of riser pipe 2"
Type of riser pipe schedule 40 flush joint PVC

Diameter of borehole 4"

Type of backfill cement grout to 5 feet
In situ sediment to 24.4 feet

Type of seal Bentonite Pellets
Depth to top of seal 24.4'

Depth to top of sand pack 28.0'

Depth to top of screen 29.7'
Type of screened section .010" slotted schedule 40 PVC

I.D. of screened section 2"

Depth to bottom of well 39.4'

Depth of borehole 41.0'

REPORT OF MONITORING WELL W-7

DRAWN BY: KRM	CHECKED BY:	PROJECT NO: 82C2467B	DATE 7-23-84	FIGURE NO

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG of BORING No. W-7

DATE 7-23-84 SURFACE ELEVATION _____ LOCATION _____

DEPTH, ft.	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	WATER CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	(1) OTHER TESTS
0		4(1)	Dark brown organic silty fine sand					2
		12	Brown medium to find sand, trace of organics, trace of silt					NR(4)
10		19						100
		11						350
		18(2)						>1000
20		10(3)						3
		8	Becoming tan medium to fine sand, trace silt.					12
30		6						NR
		3						NR
		5						NR
40		2						NR
		7						NR
50		5						NR
		7	Becoming grey medium to fine sand, trace of silt.					1
		15						NR
60		6						0.5
		10						NR
70		8						NR
		5						NR
		5						NR
80								
90								

scale error

1. 3½-inch O.D. Split Spoon sampler driven with 140 lb hammer.
2. Offset approximately 3 feet west of the original borehole due to obstruction.
3. 3½ inch OD split spoon sampler driven with 300 lb hammer.
4. No recovery.

(1)OVA reading in ppm

Completion Depth 41 Feet Water Depth 2 Feet Date 7-23-84

Project Name Beatrice Project Number 82C2467B

WCC-RP1

Woodward-Clyde Consultants

LOG of BORING No. B-1

DATE 8/30/83 SURFACE ELEVATION 45.8 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0					
		13	Tan fine sand, trace of medium sand	40.8	ND
5		27	Tan to gray fine sand, trace of coarse to medium sand	38.8	<1
		24	Tan gravelly coarse to fine sand	36.8	<1
10		24	Tan fine sand, trace of medium sand	34.3	<1

(1) 3-1/2 - inch O.D. split spoon sampler driven with 300 lb. hammer

Completion Depth 11 Feet Water Depth NA Feet Date 8/30/83

Project Name Beatrice Project Number B2C2467

Woodward-Clyde Consultants

LOG of BORING No. B-4

DATE 8/30/83 SURFACE ELEVATION 46.8 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Split (ppm)
0					
		9	Tan to gray fine sand, trace of medium sand		1
5		38			1.2
		25			1
10		18		35.8	<1

(1) 3-1/2 - inch O.D. split spoon sampler driven with 300 lb. hammer

Completion Depth 11 Feet Water Depth NA Feet Date 8/30/83

Project Name Beatrice Project Number 82C2467

Woodward-Clyde Consultants

LOG of BORING No. B-3

DATE 8/31/83 SURFACE ELEVATION 46.6 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0		-	Brown to black organic silty fine Sand	44.6	1.4
5		14	Tan fine Sand, trace of medium sand		7
		35			2
		20			1.2
10		14		35.6	< 1

(1) 3-1/2 - inch O.D. split spoon sampler driven with 300 lb. hammer

Completion Depth 10 Feet Water Depth NA Feet Date 8/31/83

Project Name Beatrice Project Number 82C2467

Woodward-Clyde Consultants

LOG of BORING No. B-4

DATE 9/1/83 SURFACE ELEVATION 46.5 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0		4	Brown to black organic, silty coarse to fine Sand	44.5	30
		9	Tan silty fine Sand, trace of organics, trace of medium Sand	42.5	50
5		26			>1000
		19	Tan to brown fine Sand, trace of medium Sand,	38.5	>1000
10			(1) 3-1/2 - inch O.D. split spoon sampler driven with 300 lb. hammer		

Completion Depth 8 Feet Water Depth NA Feet Date 9/1/83

Project Name Beatrice Project Number 82C2467

Woodward-Clyde Consultants

LOG of BORING No. B-5

DATE 9/1/83 SURFACE ELEVATION 44.3 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0		4	Black organic silty fine Sand	42.3	<1
		11			<1
5		20	Tan fine Sand, trace of medium Sand		3
		27			>100
		14		34.3	9
10					

(1) 3-1/2 - inch O.D. split spoon sampler driven with 300 lb. hammer

Completion Depth 10 Feet Water Depth NA Feet Date 9/1/83

Project Name Beatrice Project Number 82C2467

Woodward-Clyde Consultants

LOG OF BORING NO. B-8

DATE 9/1/83 SURFACE ELEVATION 45.0 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	QVA Soil (ppm)
0		5	Black to tan organic silty fine Sand	43.0	< 1
		8	Tan fine Sand, trace of medium Sand		< 1
5		24			1
		30			1
		27		35.0	1
10					

(1) 3-1/2 - inch O.D. split spoon sampler driven with 300 lb. hammer

Completion Depth 10 Feet Water Depth NA Feet Date 9/1/83

Project Name Beatrice Project Number 82C2467

Woodward-Clyde Consultants

LOG of BORING No. B-7

DATE 9/2/83 SURFACE ELEVATION 44.6 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil (ppm)
0		3	Brown to black organic silty fine Sand	42.6	< 1
		19	Tan to brown fine Sand		< 1
5		24	-with trace of medium sand		1.4
		25			1.8
		25		34.6	-
10					

(1) 3-1/2 - inch O.D. split spoon sampler driven with 300-lb. hammer

Completion Depth 10 Feet Water Depth NA Feet Date 9/2/83

Project Name Beatrice Project Number 82C2467

Woodward-Clyde Consultants

LOG of BORING No. B-8

DATE 9/2/83 SURFACE ELEVATION 43.7 LOCATION See Plate

DEPTH, ft.	SAMPLES	(1) SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	OVA Soil ppm
0		2	Black organic silty fine Sand	41.7	<1
		24	Brown fine Sand, trace of medium Sand		2
5		25			18
		26			1.2
		21	medium to fine sand	33.7	1
10					

(1) 3-1/2 - inch O.D. split spoon sampler driven with 300 lb. hammer

Completion Depth 10 Feet Water Depth NA Feet Date 9/2/83

Project Name Beatrice Project Number 82C2467

Woodward-Clyde Consultants

[illegible] DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

TO Weston Geophysical Corp... | ADDRESS Westboro, Mass

PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass

REPORT SENT TO above | PROJ. NO.

SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

DATE

HOLE NO. OW8

LINE & STA.

OFFSET

SURF. ELEV.

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.
At 2'7" after Comp. Hours	Type	HW	None	None
	Size I D	4"		
At ____ after ____ Hours	Hammer Wt	300#		BIT
	Hammer Fall	24"		

	Date	Time
START	10/4/85	a.m. p.m.
COMPLETE	10/4/85	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		No samples							General description of soil from wash - Brown fine to med. SAND, w/tr. of medium gravel & silt			
								14'				
									Bottom of Boring 14'			
									Installed O.W. @ 18'			

GROUND SURFACE TO 14' USED 4 "CASING: THEN Installed well

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

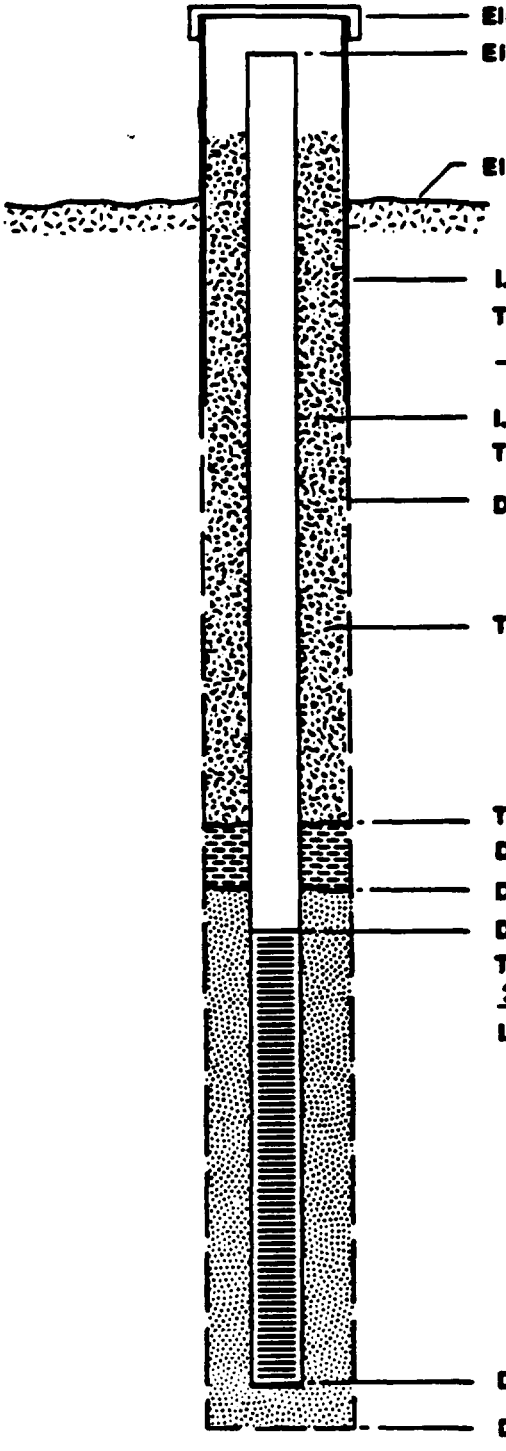
SUMMARY:
Earth Boring
Rock Coring
Samples

HOLE NO. OW8-S

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. W-8



Elevation - Top of casing 47.30

Elevation - Top of riser pipe

Elevation - Ground surface 45.42

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 59.8

Depth - Top of sand pack 63.9

Depth - Top of screen 66.0'

Type of screened section Sch 40 PVC, No. 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 76.0'

Depth - Bottom of borehole 77.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 2

TO Weston Geophysical Corp. | ADDRESS Westborn, Mass

PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass

REPORT SENT TO above | PROJ. NO.

SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

DATE

HOLE NO. OW8-D W-8

LINE & STA.

OFFSET

SURF. ELEV.

GROUND WATER OBSERVATIONS

At 2'9" after Comp. Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW NW	S/S	NV2
Size I.D.	4" 3"	1 3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

	Date	Time
START	9/26/85	a.m. p.m.
COMPLETE	10/1/85	a.m. p.m.
TOTAL HRS.		

BORING FOREMAN R. Eastwood

INSPECTOR

SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		0'-2'	D	1	1	1	D/loose		Brown fine SAND	1	24"	16"
						2						
		2'-4'	D	1	3	4	W/loose	4'		2	24	19"
						4						
		4'-6'	D	8	13	18	W/m/d		Brown fine SAND & Fine to medium gravel, tr. of silt			
						22						
		9'-11'	D	5	5	6	W/loose			4	24	13"
						9						
		14'-16'	D	5	5	5	"			5	24	14"
						10						
								18'6"				
		19'-21'	D	10	10	10	W/m/d		Brown fine SAND w/fine to medium gravel & silt layers	6	24	19"
						10						
		24'-26'	D	5	7	10	W/loose			7	24	17"
						9						
		29'-31'	D	6	8	14	W/m/d			8	24	12"
						13						
		34'-36'	D	7	8	10	"			9	24	10"
						12		37'				

GROUND SURFACE TO 62' USED 4 & 3 "CASING: THEN cored

Sample Type
D: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density
0-10 Loose
10-30 Med. Dense
30-50 Dense
50 + Very Dense

Cohesive Consistency
0-4 Soft
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff
30 + Hard

SUMMARY:
Earth Boring 62'
Rock Coring 15'
Samples 13

HOLE NO OW8-D

TOWN PRESS - EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 2 OF 2
DATE
HOLE NO. W-8 OW8-D
LINE & STA.
OFFSET
SURF. ELEV.

TO | ADDRESS
PROJECT NAME | LOCATION
REPORT SENT TO | PROJ. NO.
SAMPLES SENT TO | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At ____ after ____ Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type			
Size I.D.			
Hammer Wt			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		

BORING FOREMAN
INSPECTOR
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		39'-41'	D	16	14	13	W/m/d		Brown medium to coarse SAND &	10	24"	11"
						25			fine SAND w/fine to medium			
								43'	gravel			
		44'-46'	D	16	17	23			Brown medium to coarse SAND	11	24"	9"
						18			& fine Sand with coarse			
								47'6"	Gravel and silt			
						*			Brown very dense medium to			
		49'-51'	D	173/3"	12/3"				coarse SAND & coarse gravel &	12	24"	8"
				*8	*7	*6			cobbles, silt			
		@ 54'	Refusal							0	0	0
		59'-61'	D	62	60	129			Pushed cobble	13	24"	0
						173/4"		61'6"				
		62'-67'	C						Gray very badly fractured	C1	5'	4'2
									GABBRO DIORITE interbedded			
									w/quartz & Gneiss			
		67'-72'	C						Note: 1. *Denotes 300# wt.	C2	5'	4'
									2. 9" Seam @ 64' & 8' Seam @	70'6"		
									3. 50% water loss while coring			
									after hitting seam			
									Installed 2" PVC O.W. @ 80'			
		72'-77'	C							C3	5'	5'
								77'				
									Bottom of Boring 77'			

GROUND SURFACE TO ____ USED ____ "CASING: THEN ____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler
Cohesionless Density: 0-10 Loose; 10-30 Med. Dense; 30-50 Dense; 50+ Very Dense
Cohesive Consistency: 0-4 Soft; 4-8 M/Stiff; 8-15 Stiff; 15-30 V-Stiff; 30+ Hard

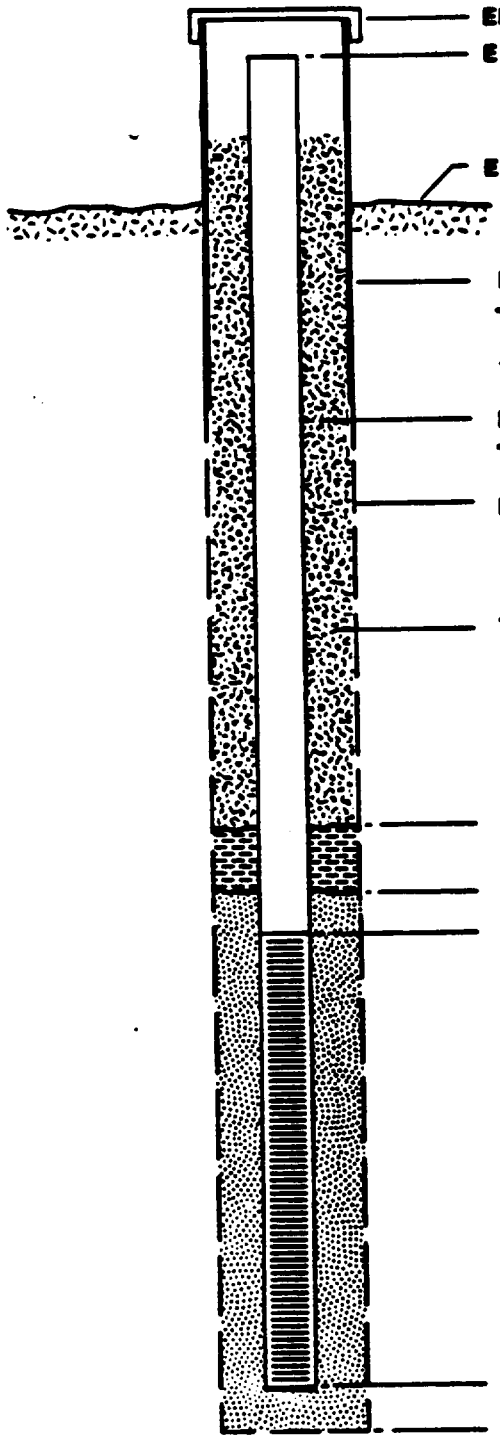
SUMMARY:
Earth Boring
Rock Coring
Samples

HOLE NO OW8-D

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. SW-8



Elevation - Top of casing 47.62

Elevation - Top of riser pipe —

Elevation - Ground surface 45.03

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 9.7'

Depth - Top of sand pack 14.0'

Depth - Top of screen 18.0'

Type of screened section Sch 40 PVC, No. 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 23.0

Depth - Bottom of borehole 24.0

Weston Geophysical

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. OW8-M
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp... | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 3' after Comp. Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	None	None
Size I D	4"		
Hammer Wt	300#		BIT
Hammer Fall	24"		

	Date	Time
START	10/4/85	a.m. p.m.
COMPLETE	10/5/85	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING: Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc	SAMPLE No	Pen	Rec
		No samples							General Description of soil from wash Brown fine to medium SAND with tr. of fine to medium gravel			
								24 '				
									Bottom ot Boring 24' Installed O.W. @ 28'			

GROUND SURFACE TO 24' USED 4 "CASING: THEN Installed O.W.

Sample Type
D: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler
Cohesionless Density: 0-10 Loose; 10-30 Med. Dense; 30-50 Dense; 50 + Very Dense
Cohesive Consistency: 0-4 Soft; 4-8 M/Stiff; 8-15 Stiff; 15-30 V-Stiff; 30 + Hard

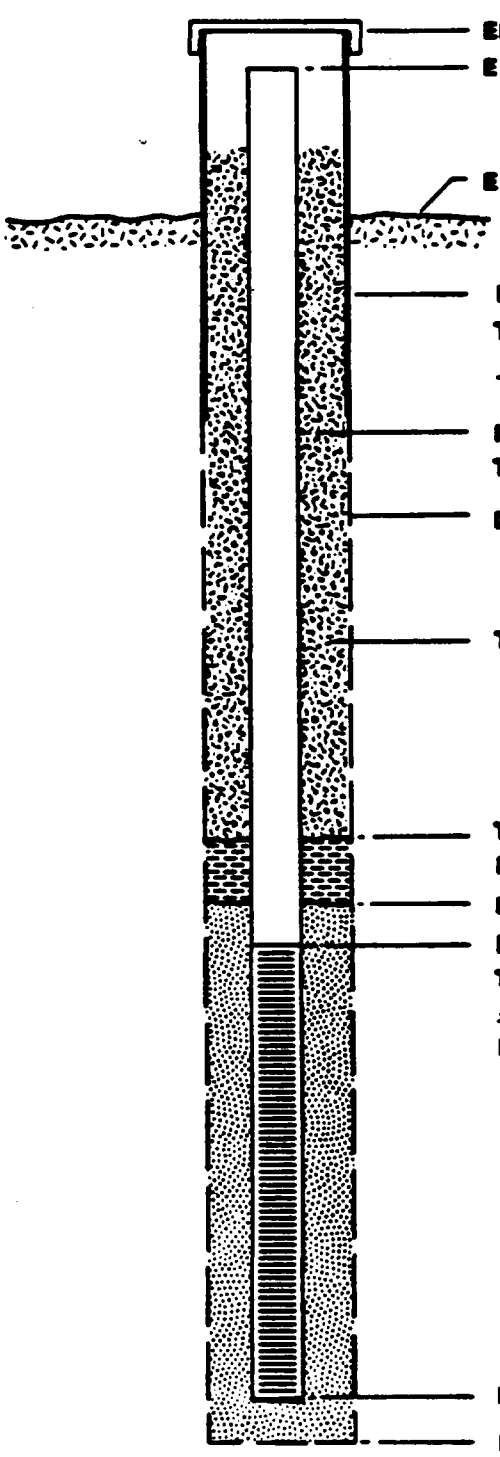
SUMMARY:
Earth Boring 24'
Rock Coring
Samples

HOLE NO. OW8-M

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. CW-3



Elevation - Top of casing: 47.84

Elevation - Top of riser pipe: _____

Elevation - Ground surface: 45.22

I.D. of surface casing: 4"

Type of surface casing: Steel

I.D. of riser pipe: 2.0"

Type of riser pipe: Sch 40 PVC

Diam of borehole: 4.0"

Type of backfill: Natural

Type of seal: Bentonite Pellets

Depth - Top of seal: 49.0

Depth - Top of sand pack: 51.1

Depth - Top of screen: 53.0'

Type of screened section: Sch 40 PVC. No. 10 slot

I.D. of screened section: 2.0"

Depth - Bottom of well: 58.0'

Depth - Bottom of borehole: 59.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. ~~OW-8~~ OW8-C
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp... | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 2'10" after Comp. Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	None	None
Size I.D.	4"		
Hammer Wt.	300#		BIT
Hammer Fall	24"		

	Date	Time
START	10/3/85	a.m. p.m.
COMPLETE	10/3/85	a.m. p.m.
TOTAL HRS.		

BORING FOREMAN R. Eastwood
INSPECTOR
SOILS ENGR.

LOCATION OF BORING Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		No samples						43'	General description of soil from wash - Brown fine to medium SAND w/medium to coarse gravel, tr. of silt			
								59'	Picked up cobble layer Brown fine to medium SAND, w/medium to coarse gravel & cobbles & boulders			
									Bottom of Boring 59' Installed O.W. @ 63'			

GROUND SURFACE TO 59' USED 4 "CASING: THEN Installed O.W.

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

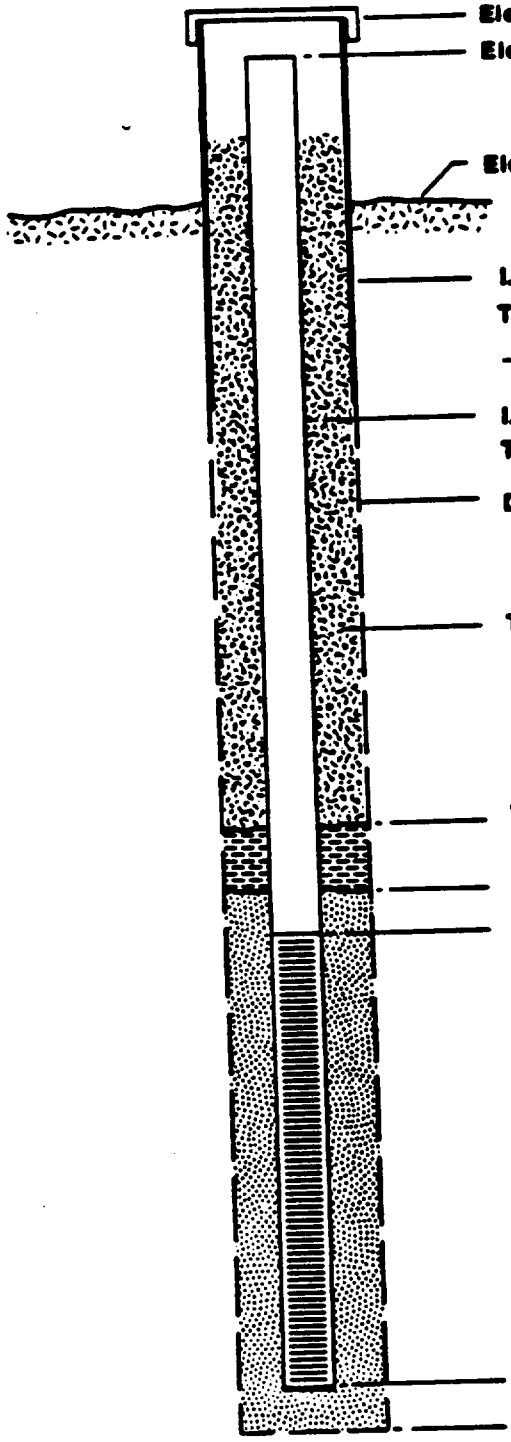
SUMMARY:
Earth Boring 59'
Rock Coring
Samples -

HOLE NO OW8-C

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. OW-9



Elevation – Top of casing 49.94

Elevation – Top of riser pipe

Elevation – Ground surface 46.17

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Re-to-te Seal

Depth – Top of seal 2.0'

Depth – Top of sand pack 3.0'

Depth – Top of screen 4.0'

Type of screened section Sch 40 PVC, No. 10 slot

I.D. of screened section 2.0"

Depth – Bottom of well 14.0'

Depth – Bottom of borehole 15.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I.

SHEET 1 OF 1
DATE
HOLE NO. OW-9
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp. | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 3'-6" after Comp. Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW		
Size I.D.	4"		
Hammer Wt.	300#		BIT
Hammer Fall	24"		

	Date	Time
START	10/10/85	a.m. p.m.
COMPLETE	10/10/85	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		No samples							General description of soil from wash Brown very coarse & dense sand & gravel & silt & cobbles & boulder fill			
		Note: Drilled ahead to advance casing						14'-0"				
									Bottom of Boring 14'-0"			
									17' Monitor well - 2"PVC			

GROUND SURFACE TO 14' USED 4 "CASING: THEN installed well

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

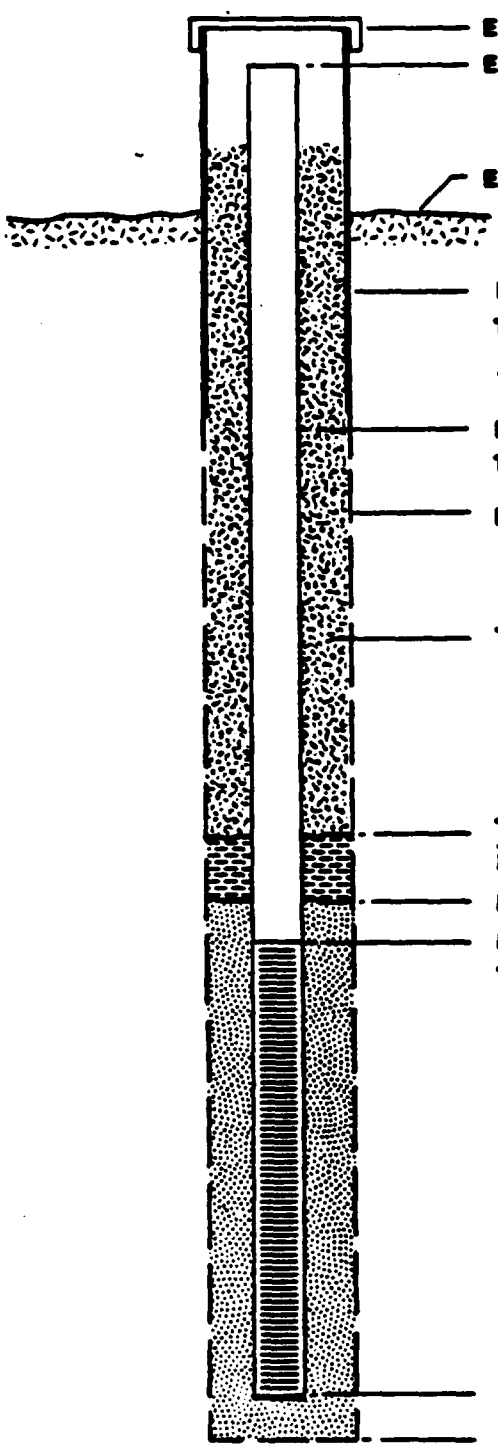
SUMMARY:
Earth Boring 14'
Rock Coring
Samples

HOLE NO. OW9-S

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. W-9



Elevation - Top of casing 48.67

Elevation - Top of riser pipe

Elevation - Ground surface 45.95

I.D. of surface casing 3'

Type of surface casing Steel

I.D. of riser pipe 2.0

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 27.2

Depth - Top of sand pack 31.0

Depth - Top of screen 34.0

Type of screened section Sch 40 PVC No 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 44.0

Depth - Bottom of borehole 44.0

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

TO Weston Geophysical Corp. ADDRESS Westboro, Mass

PROJECT NAME Economic Planning Group LOCATION Woburn, Mass

REPORT SENT TO above PROJ. NO

SAMPLES SENT TO Taken at Site OUR JOB NO. 86-163

DATE

HOLE NO. OW-9 ~~OW9-D~~

LINE & STA.

OFFSET

SURF. ELEV.

GROUND WATER OBSERVATIONS

At 3'-3" after Comp. Hours

At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	S/S	NV-II
Size I D	4"	1-3/8"	2-1/8"
Hammer Wt	300#	140#	BIT
Hammer Fall	24"	30"	Diamond

	Date	Time
START	10/7/85	____ a.m. p.m.
COMPLETE	10/8/85	____ a.m. p.m.
TOTAL HRS.		

BORING FOREMAN R. Eastmond

INSPECTOR

SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		0'- 2'	D	2	3	5			6"Brown TOPSOIL	1	24"	14"
				10					Very coarse Brown SAND &			
		2'- 3'	D	14	79				gravel, trace silt	2	12"	5"
								5'-0"				
		4'- 5'	D	110	100				Very dense coarse SAND &	3	12"	3"
									gravel, cobbles, silt, Till			
		9'- 11'	D	63	31	31				4	24"	13"
				32								
		14'-16'	D	22	24	32				5	24"	10"
				30								
Note: Drilled ahead to advance casing.		19'-21'	D	53	47	32				6	24"	9"
				35								
		24'-26'	D	37	31	94				7	24"	14"
				103								
		28'-9" Refusal					min/ft		@28'-9"Refusal on Roller bit			
		29'- 34'	C				5		BEDROCK	C1	60"	60"
							6		Very massive & hard gray Gab-			
							5½		bro Diorite interbedded			
							5		with Quartz & Granite Gneiss			
							5					
		34'-39'	C				5			C2	5'	5'
							5½					
							6		47' 2" PVC Monitor well			
							5½					
							5½					
		39'- 44'	C				5			C3	5'	5'
							5					
							5½					
							5½					
							5½	44'-0"				
									Bottom of Boring 44'-0"			

GROUND SURFACE TO 29' USED 4 & 3 "CASING: THEN C to 44'

Sample Type
D: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

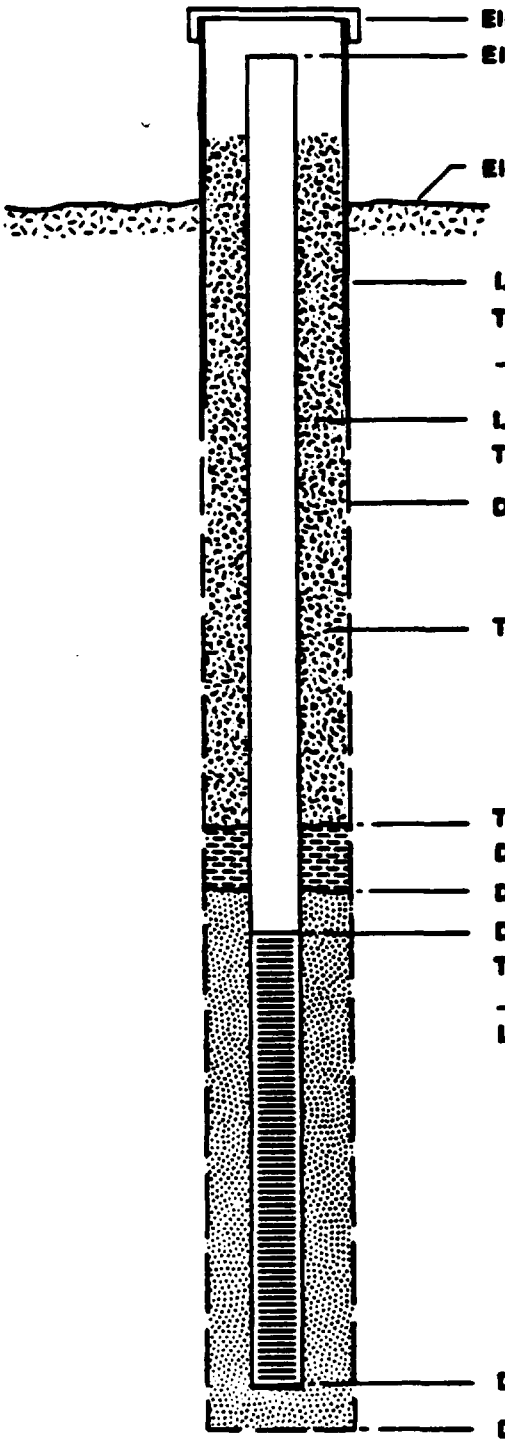
SUMMARY:
Earth Boring 29'
Rock Coring 15'
Samples 7

HOLE NO. OW9-D

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. SW-9



Elevation - Top of casing 48.93

Elevation - Top of riser pipe ———

Elevation - Ground surface 46.20

I.D. of surface casing 4"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 7.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 14.3

Depth - Top of sand pack 18.0

Depth - Top of screen 20.0

Type of screened section Sch 40 PVC, No. 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 25.0

Depth - Bottom of borehole 25.5

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. 86-7 ~~Grout~~
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp... | ADDRESS Westborn, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 3'-7" after Comp Hours
At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW		
Size I.D.	4"		
Hammer Wt.	300#		BIT
Hammer Fall	24"		

	Date	Time
START	10/9/85	a.m.
COMPLETE	10/9/85	p.m. a.m. p.m.
TOTAL HRS.		

BORING FOREMAN R. Eastwood
INSPECTOR
SOILS ENGR.

LOCATION OF BORING

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		No samples							General description of soil from wash - Brown very coarse SAND & gravel & cobbles & boulders Till			
								26'-0"				
									Bottom of Boring 26'-0"			
									28' Monitor well, 2" PVC			

GROUND SURFACE TO 26' USED 4 "CASING: THEN installed well

Sample Type
D: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

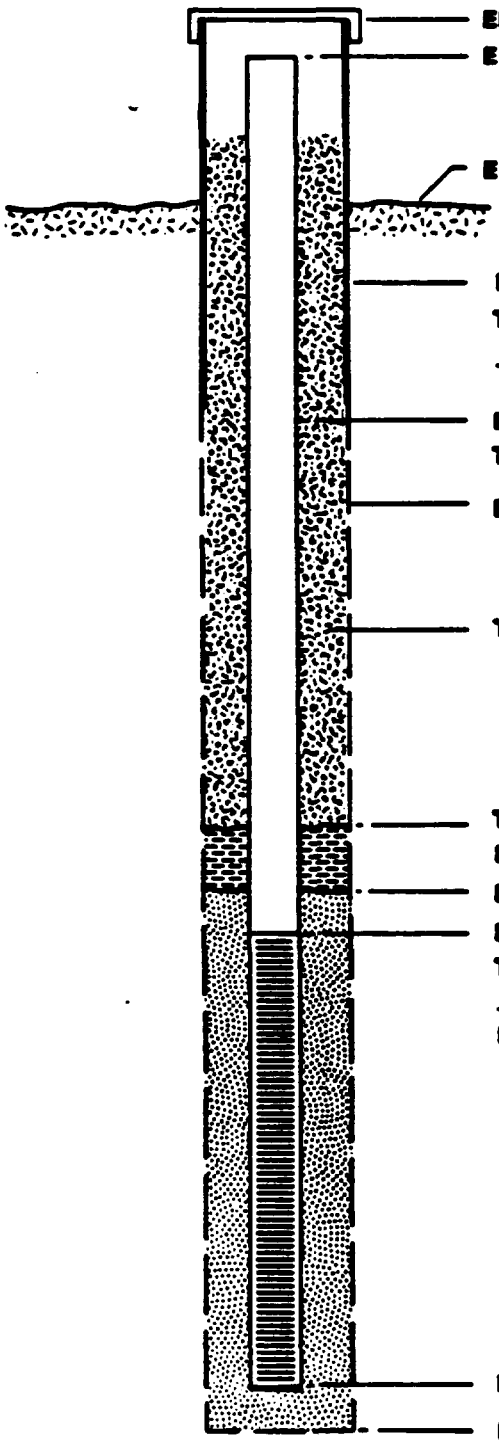
SUMMARY:
Earth Boring 26'
Rock Coring
Samples

HOLE NO OW9-M

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. OW-10



Elevation - Top of casing 48.97

Elevation - Top of riser pipe

Elevation - Ground surface 46.56

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bento & Pellets

Depth - Top of seal 0.5

Depth - Top of sand pack 2.0

Depth - Top of screen 2.5'

Type of screened section Sch 40 PVC No. 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 12.5'

Depth - Bottom of borehole 14.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. GJ-10 SW-13
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp. ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group LOCATION Woburn, Mass
REPORT SENT TO above PROJ. NO.
SAMPLES SENT TO Taken at Site OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 4'4" after Hours
At after Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	S/S	
Size i D.	4"	1 3/8"	
Hammer Wt	300#	140#	BIT
Hammer Fall	24"	30"	

	Date	Time
START	9/19/85	a.m.
COMPLETE	9/19/85	p.m.
TOTAL HRS.		

BORING FOREMAN R. Eastwood
INSPECTOR
SOILS ENGR.

LOCATION OF BORING Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock - color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		0'-2'	D	1	3	3	M/loose		Brown fine to medium SAND &	1	24"	0"
						2		2'	medium to coarse gravel,			
		2'-4'	D	4	4	3			some silt	2	24	13"
						6		4'6"	Very fine Brown SAND, some			
		4'-6'	D	13	35	57	W/v/d		medium sand, tr. of silt	3	24	13"
						43			Very coarse Brown SAND &			
									gravel, silt, some fine sand			
		9'-11'	D	24	21	19	W/m/d			4	24	24"
						18						
								14'				
		@14'	No sample						Bottom of Boring 14'			

GROUND SURFACE TO 14' USED 4 "CASING: THEN Installed O.W.

Sample Type
O: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

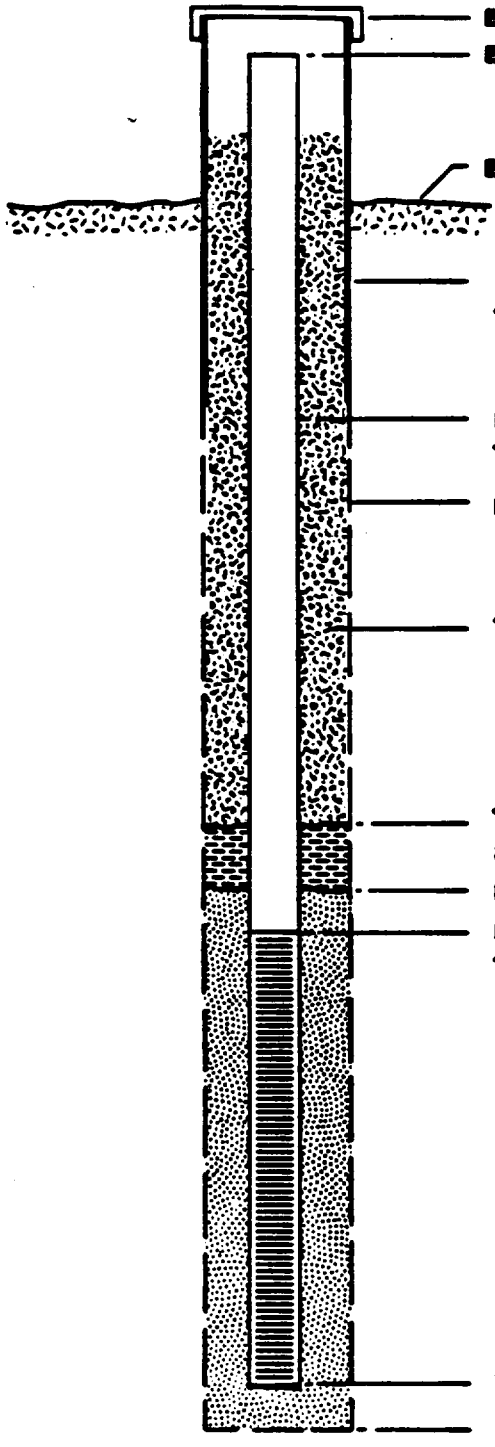
SUMMARY
Earth Boring 14'
Rock Coring
Samples 4

HOLE NO SW-13

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. W-10



Elevation - Top of casing 48.97

Elevation - Top of riser pipe

Elevation - Ground surface 46.57

I.D. of surface casing 3'

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural Backfill

Type of seal Bentonite Pellets

Depth - Top of seal 36.9'

Depth - Top of sand pack 41.3'

Depth - Top of screen 45.0

Type of screened section Sch 40 PVC, No. 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 55.0'

Depth - Bottom of borehole 61.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

TO Weston Geophysical Corp. ADDRESS Westborn, Mass

PROJECT NAME Economic Planning Group LOCATION Woburn, Mass

REPORT SENT TO above PROJ. NO.

SAMPLES SENT TO Taken at Site OUR JOB NO. 86-163

HOLE NO. 86-10 OW10

LINE & STA.

OFFSET

SURF. ELEV.

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW NW	S/S	NW2
Size I.D.	4" 3"	1 3/8"	
Hammer Wt	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

	Date	Time
START	9/20/85	a.m. p.m.
COMPLETE	9/24/85	a.m. p.m.
TOTAL HRS.		

BORING FOREMAN R. Eastwood

INSPECTOR

SOILS ENGR.

LOCATION OF BORING: Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		0'-2'	D	1	2	1	D/loose		Brown fine to medium SAND & some fine gravel	1	24"	16'
						2						
		2'-4'	D	2	3	4	W/loose	3'6"		2	24"	14'
						5						
		4'-6'	D	20	35	48	w/v/d		Brown SAND & coarse gravel, tr. of silt & cobbles	3	24"	11'
						47						
		9'-11'	D	24	30	24	W/m/d			4	24"	16'
						23						
		14'-16'	D	10	10	9	"			5	24"	10'
						9						
		19'-21'	D	18	12	11	"			6	24"	14'
						8						
		24'-26'	D	20	17	13	"			7	24"	13'
						6						
		29'-31'	D	17	13	12	W/m/d			8	24"	12'
								33'6"				
		34'-36'	D	36	28	21	W/v/d		Gray SAND & gravel & Silt & cobbles - Till	9	24"	15'
						34						
		@37'2"							Refusal w/roller bit 37'2"-39'6"-Large Boulder			
		37'2"-38'8	C									

GROUND SURFACE TO 41' USED 3 & 4 "CASING: THEN Cored

Sample Type
D: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

SUMMARY:
Earth Boring 41'
Rock Coring 20'
Samples 9

HOLE NO. OW10-

TOWN PRESS - EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 2 OF 2
DATE
HOLE NO. ~~OW10~~ W-1
LINE & STA.
OFFSET
SURF. ELEV.

TO
PROJECT NAME
REPORT SENT TO
SAMPLES SENT TO
ADDRESS
LOCATION
PROJ. NO.
OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At ____ after ____ Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type			
Size I.D.			
Hammer Wt			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		
BORING FOREMAN		
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc	SAMPLE No	Pen	Rec.
							Min/ft	39'6"	BEDROCK			
		41'-46'	C				4		Gabbro DIORITE, interbedded w/Gneiss, Quarts & Granite, very massive	C1	5'	4'8
							5					
							5½					
							5					
		46'-51'	C				4½			C2	5'	4'9
							5					
							5					
							5					
							5½					
		51'-56'	C				5			C3	5'	4'8'
							4½					
							5½					
							5½					
							5					
		56'-61'	C				5½			C4	5'	5'
							6					
							5'					
							5					
							5					
							5	61'				
									Bottom of Boring 61'			
									Note: 90% water loss while coring			
									Installed O.W. @ 58'			

GROUND SURFACE TO ____ USED ____ "CASING: THEN ____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler
Cohesionless Density: 0-10 Loose; 10-30 Med. Dense; 30-50 Dense; 50+ Very Dense
Cohesive Consistency: 0-4 Soft; 4-8 M/Stiff; 8-15 Stiff; 15-30 V-Stiff; 30+ Hard

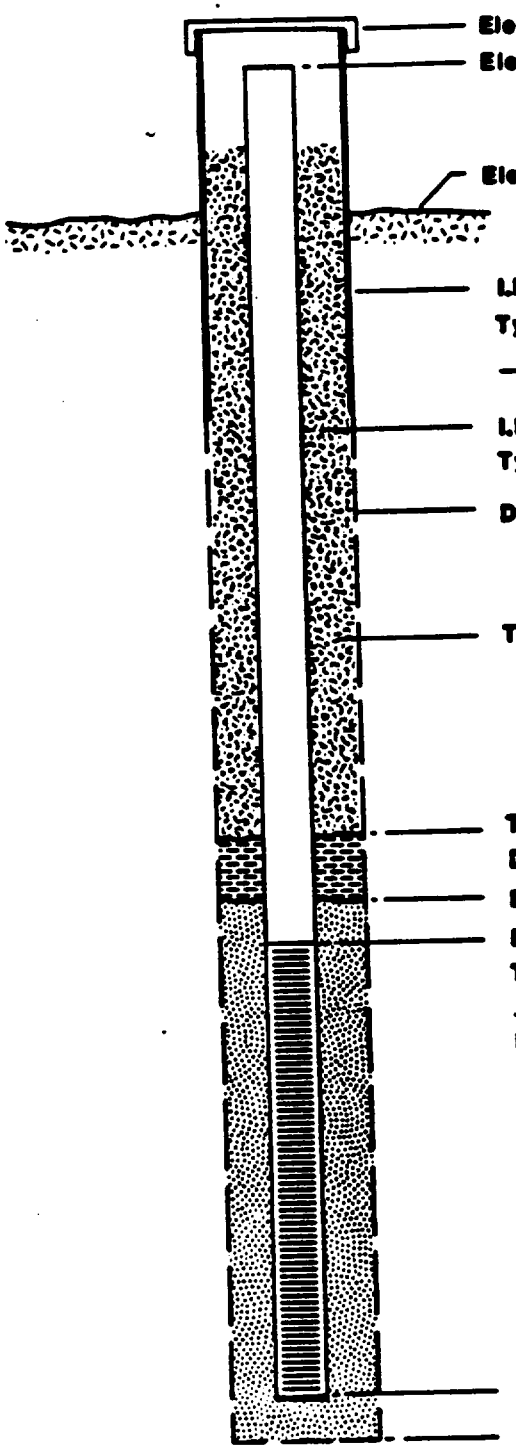
SUMMARY:
Earth Boring
Rock Coring
Samples

HOLE NO OW10-1

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. SW-10



Elevation - Top of casing 49.12

Elevation - Top of riser pipe —

Elevation - Ground surface 46.23

I.D. of surface casing 4"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 12.0

Depth - Top of sand pack 15.0

Depth - Top of screen 17.0

Type of screened section Sch 40 PVC, No. 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 22.0'

Depth - Bottom of borehole 24.0'

Weston Geophysical

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. ~~OW10 MS1-10~~
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp... | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 3'4" after Comp. Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	None	None
Size I.D.	4"		
Hammer Wt	300#		BIT
Hammer Fall	24"		

	Date	Time
START	9/25/85	a.m. p.m.
COMPLETE	9/26/85	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING: Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		No Samples							General description of soil from wash - Brown fine to medium SAND & medium to coarse gravel			
								24'				
									Bottom of Boring 24'			
									Installed O.W. @ 28'			

GROUND SURFACE TO 24' USED 4 "CASING: THEN Installed O.W.

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50+	Very Dense	15-30	V-Stiff
		30+	Hard

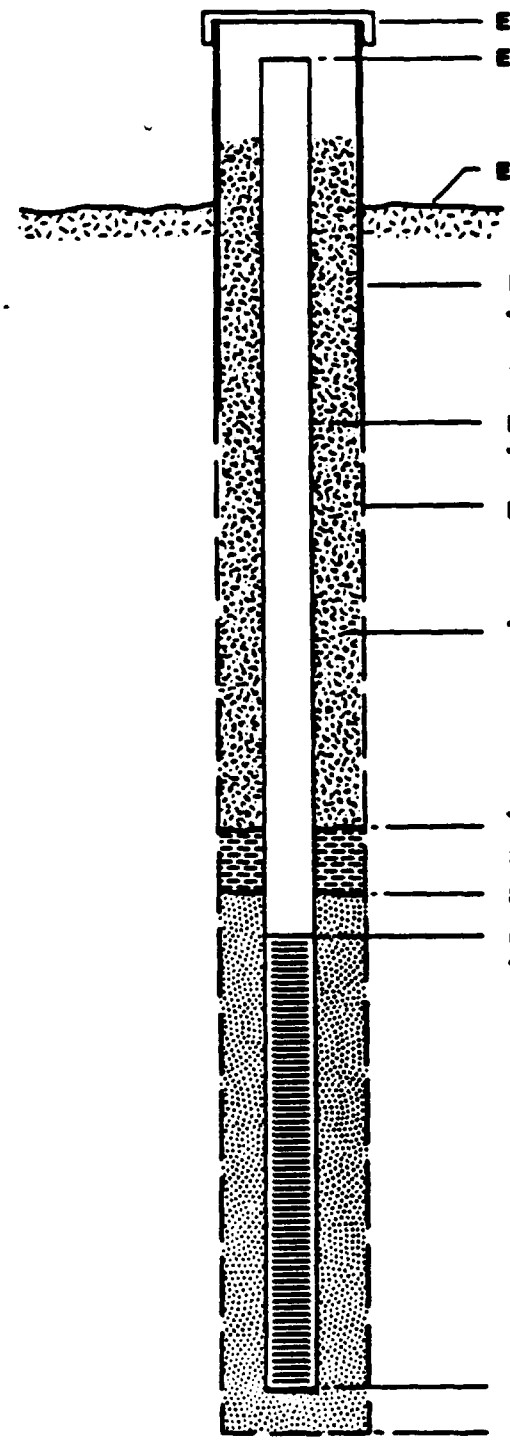
SUMMARY:
Earth Boring 24'
Rock Coring
Samples

HOLE NO. OW10-

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. CW-10



Elevation - Top of casing 48.91

Elevation - Top of riser pipe

Elevation - Ground surface 46.31

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 24.3

Depth - Top of sand pack 26.6'

Depth - Top of screen 29.0'

Type of screened section Sch 40 PVC, No. 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 34.0

Depth - Bottom of borehole 35.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. GW-10 ~~OW-10C~~
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp... | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 3'6" after Comp. Hours
At _____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	None	None
Size I.D.	4"		
Hammer Wt.	300#		BIT
Hammer Fall	24"		

	Date	Time
START	9/25/85	A.M.
COMPLETE	9/25/85	P.M.
TOTAL HRS.		

BORING FOREMAN R. Eastwood
INSPECTOR
SOILS ENGR.

LOCATION OF BORING: Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc	SAMPLE No	Pen	Rec
		No Samples							General description of soil from wash - Brown fine to medium SAND w/medium to coarse gravel			
								35'	Bottom of Boring 35'			
									Installed O.W. @ 35'			

GROUND SURFACE TO 35' USED 4 "CASING: THEN Installed O.W.

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

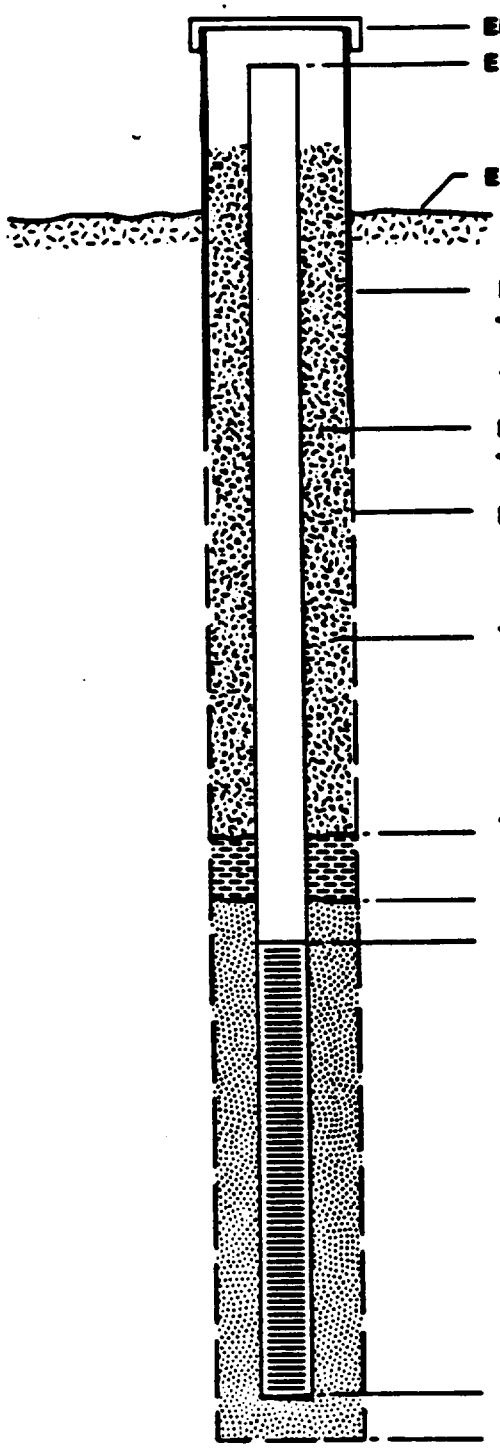
SUMMARY:
Earth Boring 35'
Rock Coring
Samples

HOLE NO. OW-10

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. W-11



Elevation - Top of casing 48.34

Elevation - Top of riser pipe 47.11

Elevation - Ground surface 46.18

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 23.0

Depth - Top of sand pack 26.5'

Depth - Top of screen 29.0

Type of screened section Sch. 40 PVC No. 10 Slot

I.D. of screened section 2.0"

Depth - Bottom of well 34.0

Depth - Bottom of borehole 36.0

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1

TO Weston Geophysical Corporation | ADDRESS Westboro, Mass.

PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass.

REPORT SENT TO above | PROJ NO.

SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

DATE

HOLE NO. W-11

LINE & STA.

OFFSET

SURF. ELEV.

GROUND WATER OBSERVATIONS

At 4'5" after 12 Hours

At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	S/S	
Size I.D.	4"	1-3/8"	
Hammer Wt	300#	140#	BIT
Hammer Fall	24"	30"	

	Date	Time
START	8/27/85	a.m. p.m.
COMPLETE	8/28/85	a.m. p.m.

TOTAL HRS.

BORING FOREMAN R. Eastwood

INSPECTOR

SOILS ENGR.

LOCATION OF BORING Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		0'-2'	D	16	13	10	Dry/m dense		Brown M-C SAND & F. Sand	1	24"	6"
						4		2'	F-M & coarse Gravel			
		2'-4'	D	7	16	20	Moist dense		same as above	2	24"	18"
						38			some silt			
		4'-6'	D	32	15	62	Wet/v dense			3	24"	10"
						58						
								7'6"				
		9'-11'	D	24	23	34	"		Brown fine Silty SAND	4	24"	17"
						33		10'6"				
									Brown fine to medium SAND & coarse Sand & Gravel & Silt			
		14'-16'	D	31	21	21	Wet dense		same as above	5	24"	12"
						16						
								19'				
		19'-21'	D	24	21	22	"		Brown silty fine SAND, trace of fine gravel	6	24"	13"
						19		22'6"				
		24'-26'	D	25	27	18	"		Brown medium to coarse SAND & fine Sand & fine to medium Gravel & coarse Gravel & Silt	7	24"	12"
						14						
		29'-31'	D	6	8	12	Wet medium dense		same as above	8	24"	8"
						14						
		34'-36'	D	9	9	8	"			9	24"	5"
						7		36'				
									Bottom of Boring 36'			
									Installed 35' Monitor Well 2" PVC Sch. 40			

GROUND SURFACE TO 34' USED HW "CASING: THEN S/S to 36'

Sample Type
D: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

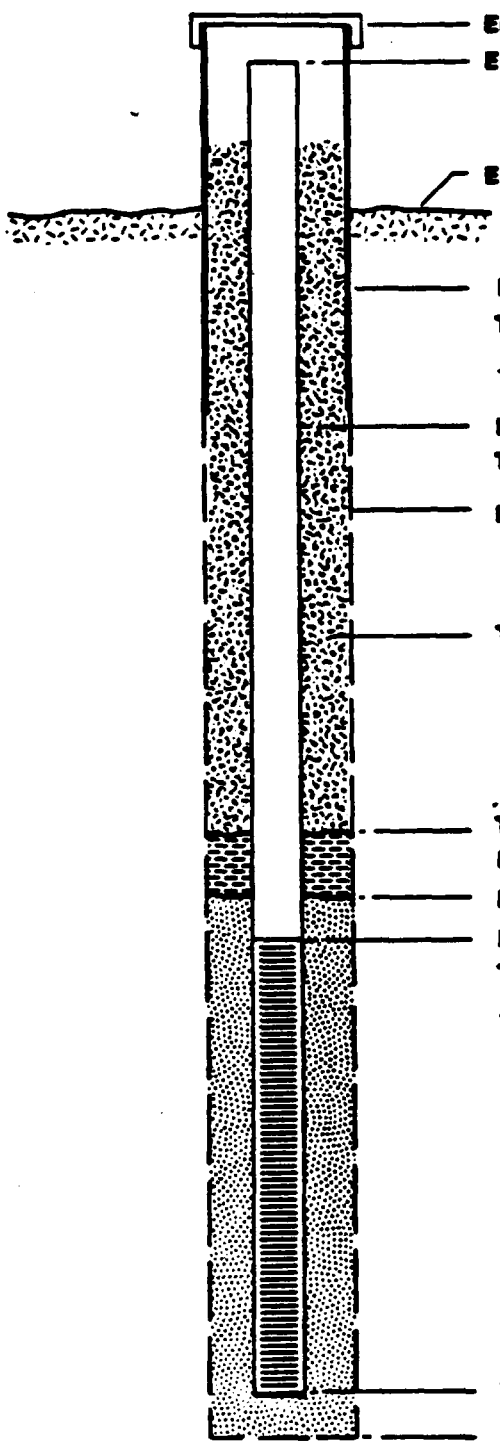
SUMMARY
Earth Boring 36'
Rock Coring
Samples 9

HOLE NO W-11

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. W-12



Elevation - Top of casing 46.75 ?

Elevation - Top of riser pipe —

Elevation - Ground surface 45.13

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Pure Pellets

Depth - Top of seal 69.0'

Depth - Top of sand pack 72.0'

Depth - Top of screen 75.0'

Type of screened section Sch 40 PVC No. 10 Slot

I.D. of screened section —

Depth - Bottom of well 80.0

Depth - Bottom of borehole 85.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 3
DATE
HOLE NO. W-12
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp... | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 2'1" after Comp. Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW NW	S/S	None
Size I.D.	4" 3"	1 3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	

	Date	Time
START	9/17/85	a.m. p.m.
COMPLETE	9/18/85	a.m. p.m.
TOTAL HRS.		

BORING FOREMAN R. Eastwood
INSPECTOR
SOILS ENGR.

LOCATION OF BORING Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		0'-2'	D	1	2	1	W/loose		Gray fine to medium SAND, tr. of silt & tr. medium gravel	1	24"	18"
						1						
		2'-4'	D	1	2	1	"			2	24"	11"
						1						
		4'-6'	D	7	13	18	W/m/d			3	24"	10"
						14						
		9'-11'	D	7	7	7	W/loose			4	24"	14"
						7						
		14'-16'	D	3	3	4	"			5	24"	12"
						4						
		19'-21'	D	2	2	2	"			6	24"	18"
						3						
		24'-26'	D	2	3	7	"			7	24"	13"
						6						
		29'-31'	D	3	4	7	"			8	24"	20"
						7						
								33'6"				
		34'-36'	D	7	3	2	"		Brown fine to medium SAND, (silty)	9	24"	24"
						2		37'				
									Brown fine to medium SAND, tr. of silt			

GROUND SURFACE TO 81' USED 3 & 4 "CASING: THEN Roller bit to bottom

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler
Cohesionless Density: 0-10 Loose; 10-30 Med. Dense; 30-50 Dense; 50+ Very Dense
Cohesive Consistency: 0-4 Soft; 4-8 M/Stiff; 8-15 Stiff; 15-30 V-Stiff; 30+ Hard

SUMMARY
Earth Boring 85'
Rock Coring
Samples 18

HOLE NO. W-12

TOWN PRESS - EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 2 OF 3

TO _____ ADDRESS _____

PROJECT NAME _____ LOCATION _____

REPORT SENT TO _____ PROJ. NO. _____

SAMPLES SENT TO _____ OUR JOB NO. 86-163

DATE _____

HOLE NO. W-12

LINE & STA. _____

OFFSET _____

SURF. ELEV. _____

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR
Type			
Size I.D.			
Hammer Wt			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		
BORING FOREMAN		
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING _____

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		39'-41'	D	8	9	13				10	24	24'
						15						
		44'-45'	D	8	9	18	W/loose		Note: Running sand 4'8" inside pipe	11	24	24'
									Brown fine to medium SAND w/some fine gravel			
		49'-51'	D	4	10	16	W/m/d		Running sand	12	24	24"
		54'-56'	D	7	11	14	"			13	24	16"
						10						
								58'6"				
		59'-61'	D	16	14	9			Very coarse Brown SAND & fine sand & coarse gravel, tr. silt & cobbles	14	24	6"
						10						
		64'-66'	D	40	22	26	"			15	24	8"
						48						
		69'-71'	D	19	14	23	"			16	24	11"
						27						
		74'-76'	D	19	14	23	"			17	24	4"
						27						

GROUND SURFACE TO _____ USED _____ "CASING: THEN _____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring _____
Rock Coring _____
Samples _____

HOLE NO W-12

TOWN PRESS – EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 3 OF 3
DATE
HOLE NO. W-12
LINE & STA.
OFFSET
SURF. ELEV.

TO
PROJECT NAME
REPORT SENT TO
SAMPLES SENT TO
ADDRESS
LOCATION
PROJ. NO.
OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At ____ after ____ Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR
Type			
Size I D.			
Hammer Wt			BIT
Hammer Fall			

	Date	Time
START		a.m p.m
COMPLETE		a.m p.m
TOTAL HRS.		

BORING FOREMAN
INSPECTOR
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock - color, type, condition, hardness, Drilling time, seams and etc	SAMPLE No	Pen	Rec
		79'-81'	D	60	123	24						
						157	W/v/d		Roller bit to 85'	18	24"	13"
		@85'						85'				
									Bottom of Boring 85'			
									Installed O.W. @ 85'			

GROUND SURFACE TO ____ USED ____ "CASING: THEN ____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O D. Sampler

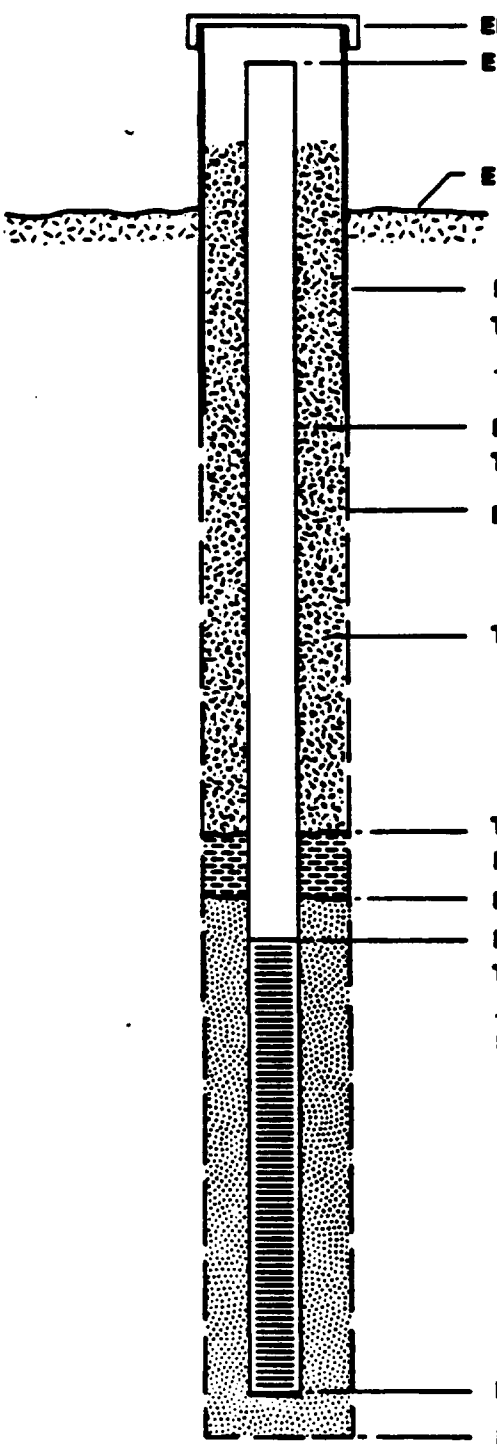
Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

SUMMARY:
Earth Boring ____
Rock Coring ____
Samples ____

HOLE NO. W-1

INSTALLATION REPORT

MONITORING WELL No. SW-12



Elevation - Top of casing 47.08

Elevation - Top of riser pipe —

Elevation - Ground surface 45.32

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 21.0'

Depth - Top of sand pack 23.5'

Depth - Top of screen 28.5'

Type of screened section Sch 40 PVC No. 10 slot

I.D. of screened section —

Depth - Bottom of well 33.5'

Depth - Bottom of borehole 34.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. S W-12
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp... | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 1'10" after Comp. Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HWNW	S/S	None
Size I.D.	4"3"	1 3/8"	
Hammer Wt	300#	140#	BIT
Hammer Fall	24"	30"	

	Date	Time
START	9/19/85	a.m. p.m.
COMPLETE	9/19/85	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING: Woods

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		No Samples							General description of soil from wash - Gray fine to medium SAND, fine to medium Gravel, trace of silt			
								34'	Bottom of Boring 34'			
									Installed O.W. @ 35'			

GROUND SURFACE TO 34' USED 4 "CASING: THEN Installed O.W.

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

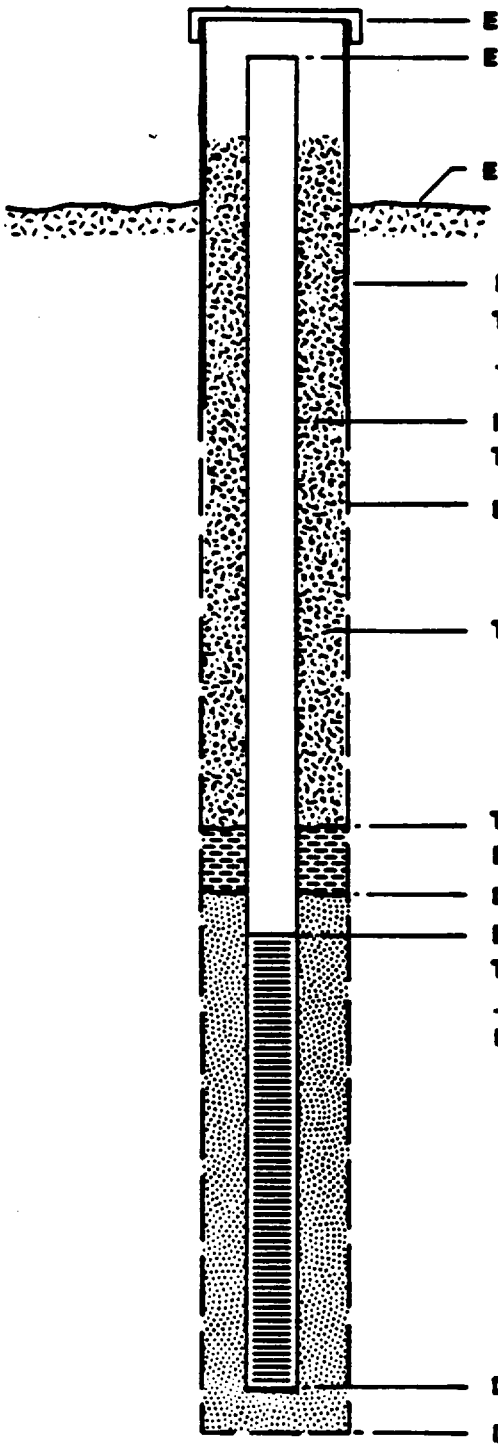
Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

SUMMARY:
Earth Boring 34'
Rock Coring
Samples

HOLE NO. SW-12

INSTALLATION REPORT

MONITORING WELL No. GW-13



Elevation - Top of casing 49.01

Elevation - Top of riser pipe —

Elevation - Ground surface 46.23

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0'

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 0.5

Depth - Top of sand pack 2.0

Depth - Top of screen 3.7'

Type of screened section Sch 40 PVC, No. 10 s/o 7

I.D. of screened section 2.0"

Depth - Bottom of well 13.7'

Depth - Bottom of borehole 14.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. OW-13 S
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp. | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 2'-9" after comp Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW		
Size I.D.	4"		
Hammer Wt.	300#		BIT
Hammer Fall	24"		

	Date	Time
START	10/19/85	a.m.
COMPLETE	10/19/85	p.m. a.m. p.m.
TOTAL HRS.		

BORING FOREMAN R. Eastwood
INSPECTOR
SOILS ENGR.

LOCATION OF BORING

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		No samples						4'-0"	General description of soil from wash - Brown fine SAND, trace silt			
								7'-6"	Gray fine SAND, fine gravel			
								14'-0"	Very coarse Brown SAND & gravel & silt & cobbles			
									Bottom of Boring 14'-0" Installed 2" PVC Monitor well 18'			

GROUND SURFACE TO 14' USED 4 "CASING: THEN installed well

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used	
trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

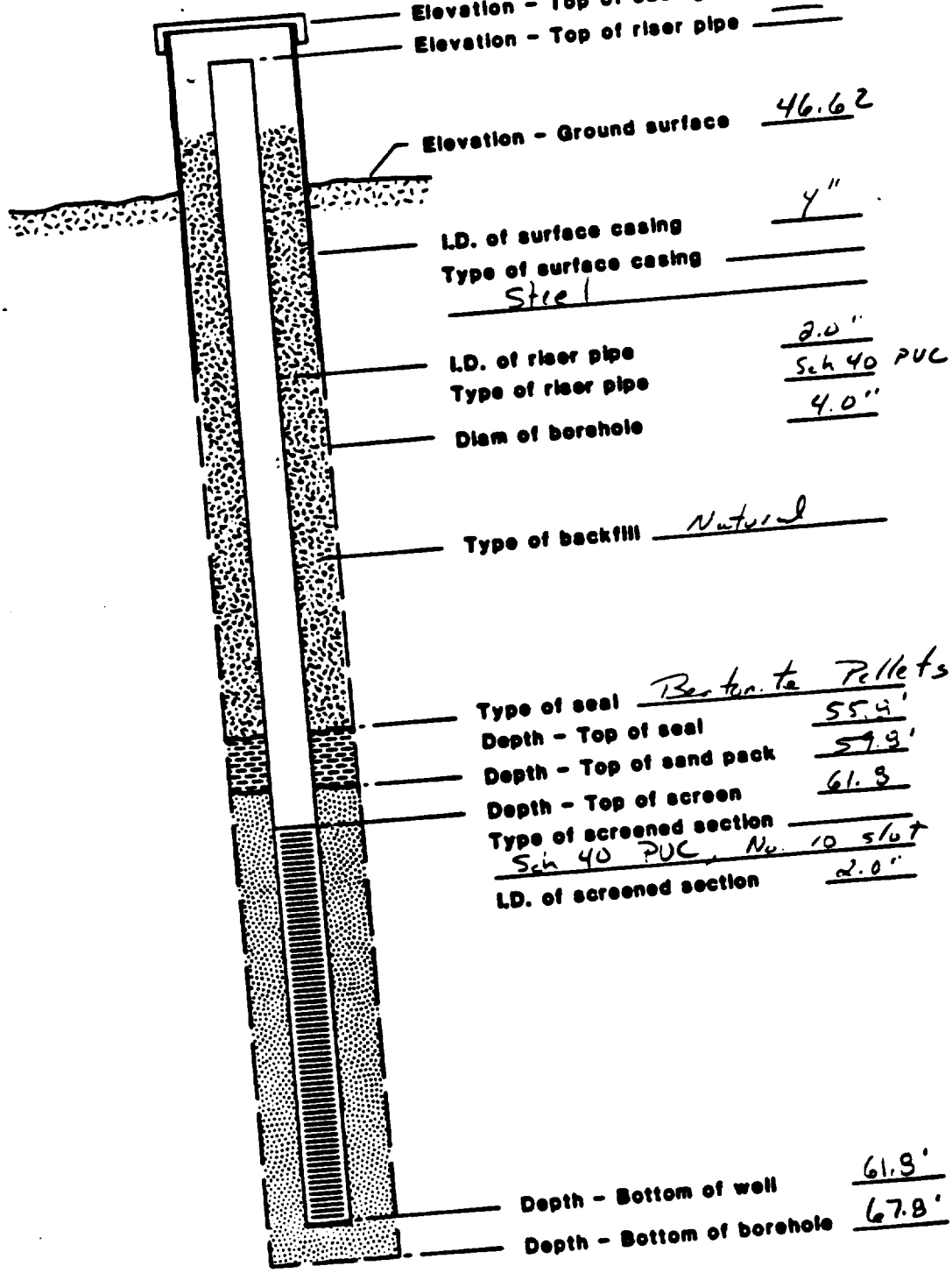
SUMMARY:
Earth Boring 14'
Rock Coring
Samples

HOLE NO OW-13S

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. W-13



Elevation – Top of casing 49.24

Elevation – Top of riser pipe

Elevation – Ground surface 46.62

I.D. of surface casing 4"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth – Top of seal 55.4'

Depth – Top of sand pack 57.9'

Depth – Top of screen 61.9

Type of screened section Sch 40 PVC, No. 10 slot

I.D. of screened section 2.0"

Depth – Bottom of well 61.9'

Depth – Bottom of borehole 67.8'

Weston Geophysical

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I.

SHEET 1 OF 2
DATE 10-13
HOLE NO. OW-13-D
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp. | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At 3'-9" after comp Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR
Type	HW NW	S/S	NV-II
Size I D	4" 3"	1-3/8"	2-1/8"
Hammer Wt	300#	140#	BIT
Hammer Fall	24"	30"	Diamond

	Date	Time
START	10/10/85	a.m.
COMPLETE	10/14/85	p.m.
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
	Drove HW-4"	0'- 2'	D	3	3	4			Brown medium to fine SAND,	1	24"	24"
				4					Trace silt			
	casing	2'- 4'	D	4	4	6				2	24"	15"
				5				4'-0"				
	Spun NW-3"	4'- 6'	D	9	12	6			Gray fine SAND, trace silt	3	24"	10"
	casing			8					& fine gravel			
								8'-6"				
		9'- 11'	D	48	51	49			Gray very coarse SAND &	4	24"	13"
				47					gravel			
		14'-16'	D	40	17	25				5	24"	14"
				24								
		19'- 21'	D	16	17	16				6	24"	5"
				18								
		24'- 26'	D	32	13	13				7	24"	5"
				11								
		29'-31'	D	12	12	18				8	24"	2"
				26								
		34'-36'	D	59	51	12				9	24"	10"
				13								
								39'-0"	Refusal w/ roller bit			
		39'	Refusal						BOULDERS	10	0"	0"

GROUND SURFACE TO 57'6" USED 4 & 3 "CASING: THEN C to 67'-6"

Sample Type
D: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

SUMMARY:
Earth Boring 57'6"
Rock Coring 10'
Samples 12

HOLE NO OW-13-

TOWN PRESS - EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 2 OF 2
DATE
HOLE NO. W-13 ~~GW-13-D~~

TO Weston Geophysical Corp. | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

LINE & STA.
OFFSET
SURF. ELEV.

GROUND WATER OBSERVATIONS
At _____ after _____ Hours
At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW		
Size i D	4"		
Hammer Wt	300#		BIT
Hammer Fall	24"		

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		

BORING FOREMAN R. Eastwood
INSPECTOR
SOILS ENGR.

LOCATION OF BORING

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No.	Pen	Rec
		39'- 44'	C	BOULDERS					Cored BOULDERS from 39'-44' Boulders from 1'-8"to 2'-3"			
		44'- 51'	Roller Bit						--used roller bit through boulders 44' to 51' --			
		51'- 52'	D*	15	52				Gray very dense & coarse SAND & gravel & silty Till	1	12"	6"
			D* = 300# wt.									
		@ 54'	Refusal -roller bit						Roller bit through boulder from 54' to 55'-9"			
		56'-56'-6"	D*	61					Gray very dense & coarse	2	6"	6"
		@57'6" refusal w/ roller bit					min/ft	57'-6"	SAND & gravel & silty Till			
		57'6"- 62'6"	C				4 5 5 4½ 5 5 5 5 5		Very massive Gray GABBRO DIORITE interbedded with Quartz & Granite @61'-3" seam - lost 90% of water	C1	60"	48"
		62'6"- 67'6"	C							C2	60"	48"
								67'-6"	Bottom of Boring 67'-6" Note: Lose 5' NW casing & Econo shoe. Also ruined a HW-4" Drive Shoe. -- 70' Monitor well - 2"PVC--			

GROUND SURFACE TO _____ USED _____ "CASING: THEN _____

Sample Type
D: Dry C: Cored W: Washed
UP: Undisturbed Piston
TP: Test Pit A: Auger V: Vane Test
UT: Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50 +	Very Dense	15-30	V-Stiff
		30 +	Hard

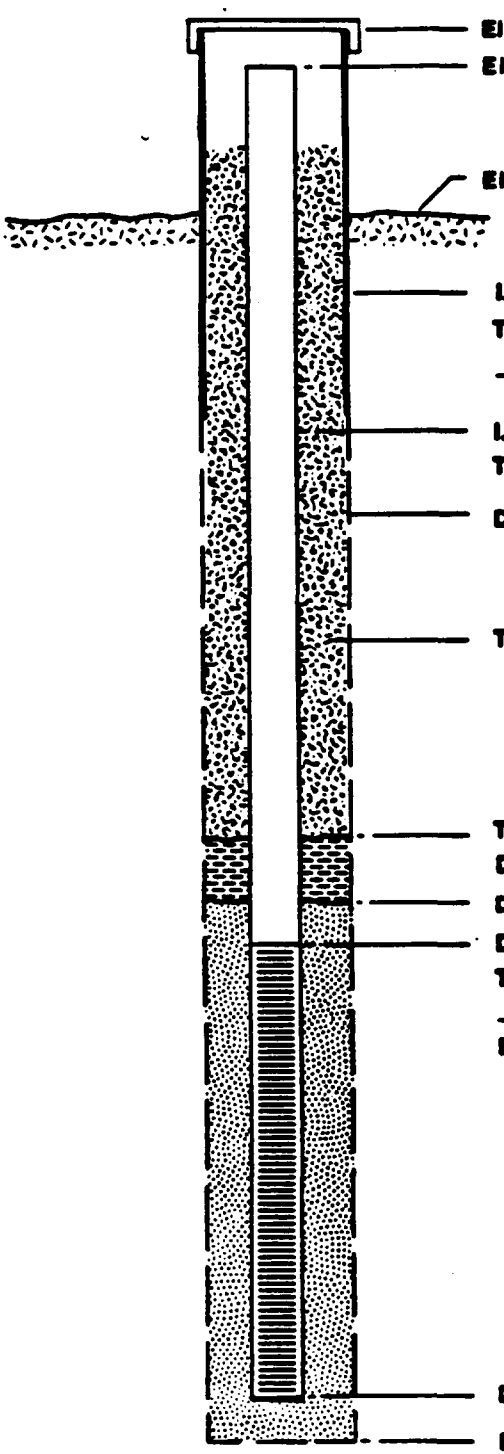
SUMMARY:
Earth Boring _____
Rock Coring _____
Samples _____

HOLE NO. W-13-D

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. CW-13



Elevation - Top of casing 48.42

Elevation - Top of riser pipe

Elevation - Ground surface 46.39

I.D. of surface casing 4"

Type of surface casing Steel

I.D. of riser pipe 2.0

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 39.0

Depth - Top of sand pack 42.2'

Depth - Top of screen 45.0

Type of screened section Sch 40 PVC No 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 50.0

Depth - Bottom of borehole 51.4

GUILD DRILLING CO., INC.
100 WATER STREET EAST PROVIDENCE, R I

SHEET ___ OF ___
DATE ___
HOLE NO. CW-13 ~~CW-12-C~~
LINE & STA. ___
OFFSET ___
SURF. ELEV. ___

TO: Weston Geophysical Corp.
ADDRESS: Westboro, Mass
PROJECT NAME: Economic Planning Group
LOCATION: Woburn, Mass
REPORT SENT TO: above
PROJ. NO. ___
SAMPLES SENT TO: Taken at Site
OUR JOB NO.: 86-163

GROUND WATER OBSERVATIONS
At 3'-4" after comp Hours
At ___ after ___ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW		
Size I.D.	4"		
Hammer Wt	300#		BIT
Hammer Fall	24"		

	Date	Time
START	10/16/85	a.m./p.m.
COMPLETE	10/17/85	a.m./p.m.
TOTAL HRS.		

BORING FOREMAN: R. Eastwood
INSPECTOR ___
SOILS ENGR. ___

LOCATION OF BORING ___

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler 0-6	6-12	12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		No samples							General description of soil from wash			
									Brown medium coarse SAND & gravel, some silt &cobbles			
								30'-6"	Boulder layer			
									Gray fine to medium SAND & silt, cobbles, boulders & till			
								50'-0"	Bottom of Boring 50'-0"			
									53' Monitor Well - 2" PVC			

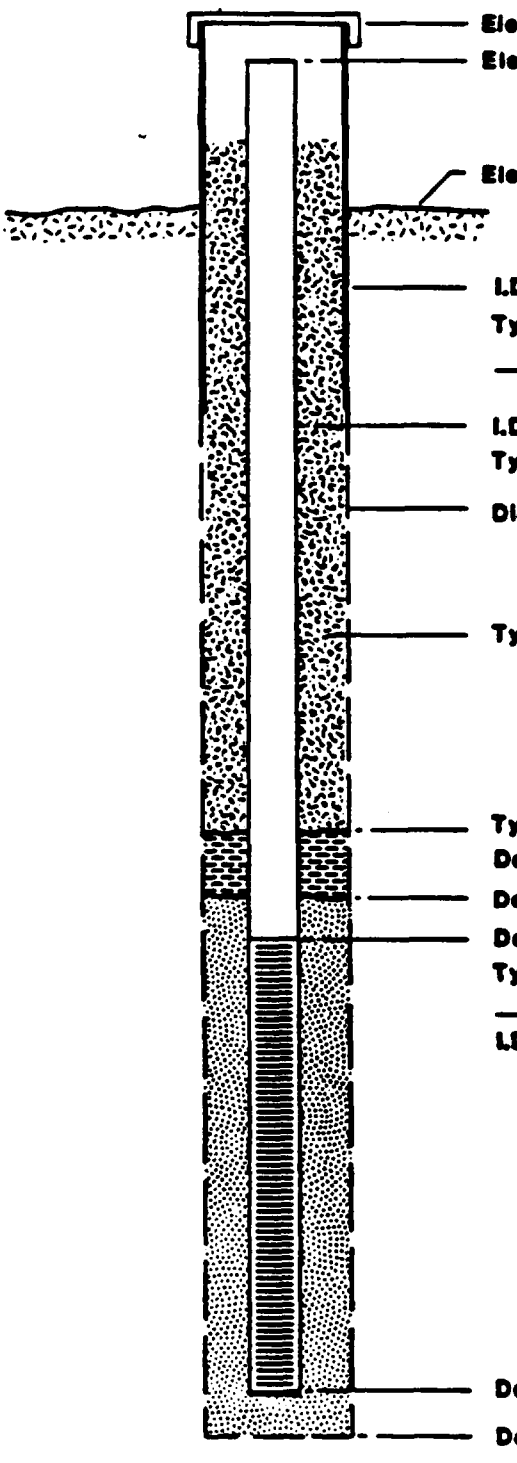
GROUND SURFACE TO 50' USED 4 "CASING: THEN installed well

Sample Type	Proportions Used	140 lb Wt. x 30" fall on 2" O.D. Sampler — Cohesionless Density	Cohesive Consistency	SUMMARY
D=Dry C=Cored W=Washed	trace 0 to 10%	0-10 Loose	0-4 Soft 30 + Hard	Earth Boring 50'
UP=Undisturbed Piston	little 10 to 20%	10-30 Med. Dense	4-8 M/Stiff	Rock Coring ___
TP=Test Pit A=Auger V=Vane Test	some 20 to 35%	30-50 Dense	8-15 Stiff	Samples ___
UT=Undisturbed Thinwall	and 35 to 50%	50 + Very Dense	15-30 V-Stiff	HOLE NO CW13-C

TOWN PRESS — EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. SW-13



Elevation - Top of casing 49.82

Elevation - Top of riser pipe —

Elevation - Ground surface 46.56

I.D. of surface casing 4"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 12.0'

Depth - Top of sand pack 16.0'

Depth - Top of screen 18.0'

Type of screened section Sch 40 PVC No. 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 23.0'

Depth - Bottom of borehole 24.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE 5-2-3
HOLE NO. OWB-M
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corp... | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At Not recorded after ____ Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR
Type	HW		
Size I D	4"		
Hammer Wt	300#		BIT
Hammer Fall	24"		

	Date	Time
START	10/18/85	____ a.m. p.m.
COMPLETE	10/18/85	____ a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		0'- 2'	D	2	2	3			Dark brown coarse to fine	1	24"	14"
				2				2'-0"	SAND, some silt			
		2'- 4'	D	2	2	3			Brown medium to fine SAND,	2	24"	15"
				6				3'-6"	some fine gravel			
		4'- 6'	D	14	10	12			Gray fine SAND, trace silt	3	24"	13"
				18								
		6'- 8'	D	18	20	30				4	24"	19"
				32				8'-0"				
		8'- 10'	D	24	39	35			Gray-brown medium to coarse	5	24"	19"
				39					SAND & gravel, some silt			
		10'-12'	D	21	22	30				6	24"	18"
				36								
		12'-14'	D	31	37	39				7	24"	17"
				49								
		14'-16'	D	20	14	15						
				13				16'-0"		8	24	9"
									Gray-brown fine to coarse SAND, some fine to coarse gravel & silt			
								25'-0"				
									Bottom of Boring 25'-0"			
									Installed 2" PVC Monitor Well			

GROUND SURFACE TO 25' USED 4 "CASING: THEN installed well

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

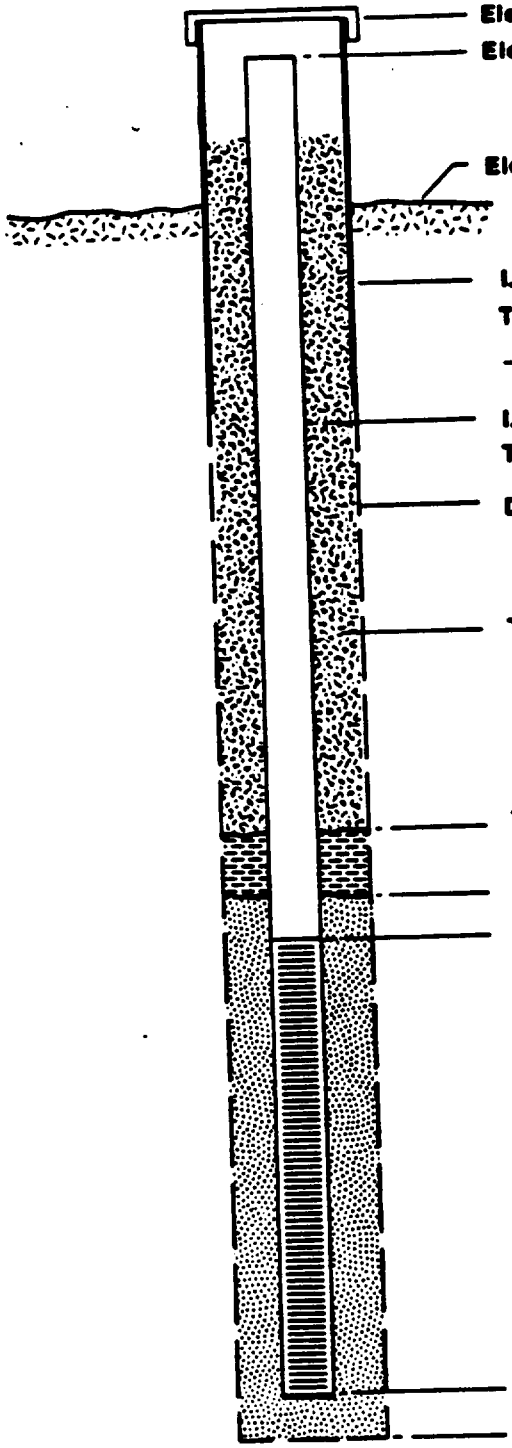
SUMMARY:
Earth Boring 25'
Rock Coring ____
Samples 8

HOLE NOOWB-M

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. OW-14



Elevation - Top of casing _____

Elevation - Top of riser pipe _____

Elevation - Ground surface _____

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 1.0'

Depth - Top of sand pack 3.0'

Depth - Top of screen 4.0'

Type of screened section Sch 40 PVC, Dia. 10 Slot

I.D. of screened section 2.0"

Depth - Bottom of well 14.0

Depth - Bottom of borehole 15.0

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE DEC-14
HOLE NO. [illegible]
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corporation | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At _____ after _____ Hours
Top of Ground
At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	NONE	
Size I.D.	4"		
Hammer Wt	300#		BIT
Hammer Fall	24"		

	Date	Time
START	11/15/85	a.m. p.m.
COMPLETE	11/15/85	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING: Swamp - Drove HW casing

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		No Samples							General description of soil from wash - Brown fine SAND, trace of silt			
								15'				
									Bottom of Boring 15'			
									Installed 2" Sch 40 PVC O.W @ 18'			

GROUND SURFACE TO 15' USED 4 "CASING: THEN Installed O.W.

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

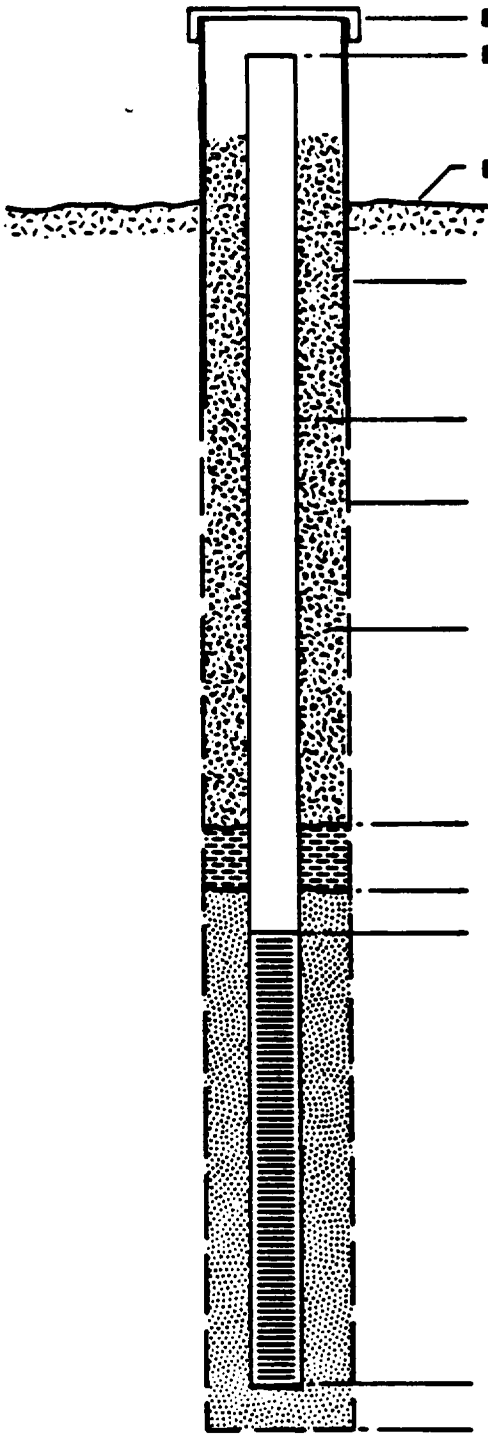
SUMMARY:
Earth Boring 15'
Rock Coring
Samples

HOLE NO. W14-S

DOWN [illegible] - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. W-14



Elevation - Top of casing ______

Elevation - Top of riser pipe ______

Elevation - Ground surface ______

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite pellets

Depth - Top of seal 68.9

Depth - Top of sand pack 73.0

Depth - Top of screen 75.0

Type of screened section Sch 40 PVC No 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 85.0

Depth - Bottom of borehole 85.0

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 3
DATE
HOLE NO W14-D
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corporation | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At _____ after _____ Hours
Top of ground
At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW NW	S/S	NVII
Size I D.	4" 3"	1 3/8"	2 3/8"
Hammer Wt	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

	Date	Time
START	11/8/85	a.m p.m
COMPLETE	11/15/85	a.m p.m
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING: Swamp - Drove HW casing

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		0'-2'	D	1	1	1	W/loose		Dark brown organic PEAT 10"	1	24"	18"
						1			Brown fine SAND, tr. of silt			
		2'-4'	D	1	2	5	"		Brown fine SAND, tr. of silt	2	24"	20"
						5						
		4'-6'	D	6	9	13	W/m/d			3	24"	16"
						16						
		9'-11'	D	1	2	3	W/loose			4	24"	14"
						2						
		14'-16'	D	2	3	4	"			5	24"	19"
						4						
		19'-21'	D	1	3	5	"			6	24"	14"
						9						
		24'-26'	D	3	5	5	"			7	24"	0
						4						
		29'-31'	D	9	14	16	W/m/d		Brown fine SAND, tr. silt	8	24"	15"
						14						
		34'-36'	D	4	7	12	"			9	24"	12"
						18						
								37'				
									Very coarse brown SAND & gravel & cobbles, silt			

GROUND SURFACE TO 40' USED 3" & 4" CASING: THEN Cored to BOB

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50+	Very Dense	15-30	V-Stiff
		30+	Hard

SUMMARY
Earth Boring 70'
Rock Coring 15' 15'
Samples 15

HOLE NO W14-D

TOWN PRESS - EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 2 OF 3

TO _____ ADDRESS _____

PROJECT NAME _____ LOCATION _____

REPORT SENT TO _____ PROJ. NO. _____

SAMPLES SENT TO _____ OUR JOB NO. 86-163

DATE _____

HOLE NO. W14C

LINE & STA. _____

OFFSET _____

SURF. ELEV. _____

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type			
Size I.D.			
Hammer Wt			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		

BORING FOREMAN _____

INSPECTOR _____

SOILS ENGR. _____

LOCATION OF BORING _____

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		39'-41'	D	60	93	27	W/m/d		Very coarse brown SAND & gravel & cobbles, silt	10	24"	13"
						14						
		44'-46'	D	52	21	9	W/m/d		Brown medium to coarse SAND & gravel, some silt & cobbles	11	24"	8"
						12						
		49'-51'	D	16	8	17	"			12	24"	8"
						23						
		54'-56'	D	6	6	22	"			13	24"	8"
						14						
		59'-61'	D	5	10	13	W/m/d			14	24"	11"
						23						
								64'				
		64'-65'6"	D	120	*49	*19			Very dense fine to medium SAND & gravel & silty Glacial Till	15	18"	10"
							Min/ft					
	**	70'-75'	C				4			C1	5'	5'
							4					
							4					
							4					
							4					
		75'-80'	C				5			C2	5'	5'
							5½					
							4½					
							5					
							5					

GROUND SURFACE TO _____ USED _____ "CASING: THEN _____

Sample Type

D=Dry C=Cored W=Washed

UP=Undisturbed Piston

TP=Test Pit A=Auger V=Vane Test

UT=Undisturbed Thinwall

Proportions Used

trace	0 to 10%
little	10 to 20%
some	20 to 35%
and	35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50+	Very Dense	15-30	V-Stiff
		30+	Hard

SUMMARY:

Earth Boring _____

Rock Coring _____

Samples _____

HOLE NO W14-D

TOWN PRESS — EAST PROV.

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 3 OF 3
DATE
HOLE NO. W14
LINE & STA.
OFFSET
SURF. ELEV.

TO | ADDRESS
PROJECT NAME | LOCATION
REPORT SENT TO | PROJ. NO.
SAMPLES SENT TO | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS

At _____ after _____ Hours

At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type			
Size I.D.			
Hammer Wt			BIT
Hammer Fall			

	Date	Time
START		a.m. p.m.
COMPLETE		a.m. p.m.
TOTAL HRS.		

BORING FOREMAN
INSPECTOR
SOILS ENGR.

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec.
		80'-85	C				5		Decomposed bedrock-very massive Gabbrodiorite interbedded w/Gneiss & Quartz	C3	5'	5'
							5					
							5					
							5					
							5					
									Bottom of Boring 85'			
									*Denotes 300# wt.			
									**Note: 50% water loss while coring			
									Installed 2" Sch 40 PVC @ 90°			

GROUND SURFACE TO _____ USED _____ "CASING: THEN _____

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency	
0-10	Loose	0-4	Soft
10-30	Med. Dense	4-8	M/Stiff
30-50	Dense	8-15	Stiff
50+	Very Dense	15-30	V-Stiff
		30+	Hard

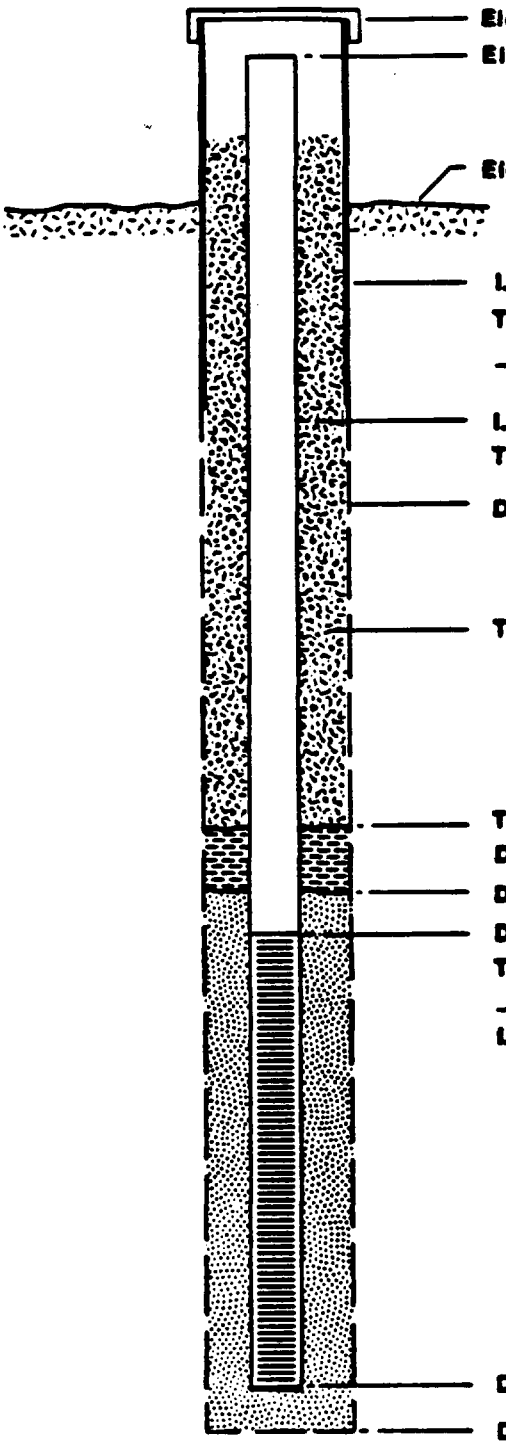
SUMMARY:
Earth Boring
Rock Coring
Samples

HOLE NO

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. CW-14



Elevation - Top of casing _____

Elevation - Top of riser pipe _____

Elevation - Ground surface _____

I.D. of surface casing 3"

Type of surface casing _____

Steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal <1.1

Depth - Top of sand pack 55.5'

Depth - Top of screen 57.5

Type of screened section _____

Sch 40 PVC, No 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 62.5

Depth - Bottom of borehole 63.0

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. CW14-C
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corporation | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS

At _____ after _____ Hours
Top of ground
At _____ after _____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	NONE	
Size I.D.	4"		
Hammer Wt	300#		BIT
Hammer Fall	24"		

	Date	Time
START	11/14/85	
COMPLETE	11/14/85	
TOTAL HRS.		

BORING FOREMAN R. Eastwood
INSPECTOR
SOILS ENGR.

LOCATION OF BORING: Swamp - Drove HW casing

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE No	Pen	Rec
		No Samples							General description of soil from wash			
								0'-35'	Brown fine SAND, tr. of silt			
								35'	Very coarse brown SAND & medium gravel, some cobbles & silt			
								63'				
									Bottom of Boring 63'			
									Installed 2" Sch 40 O.W.@63'			

GROUND SURFACE TO 63' USED 4 "CASING: THEN Installed O.W.

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density
0-10 Loose
10-30 Med. Dense
30-50 Dense
50 + Very Dense

Cohesive Consistency
0-4 Soft
4-8 M/Stiff
8-15 Stiff
15-30 V-Stiff
30 + Hard

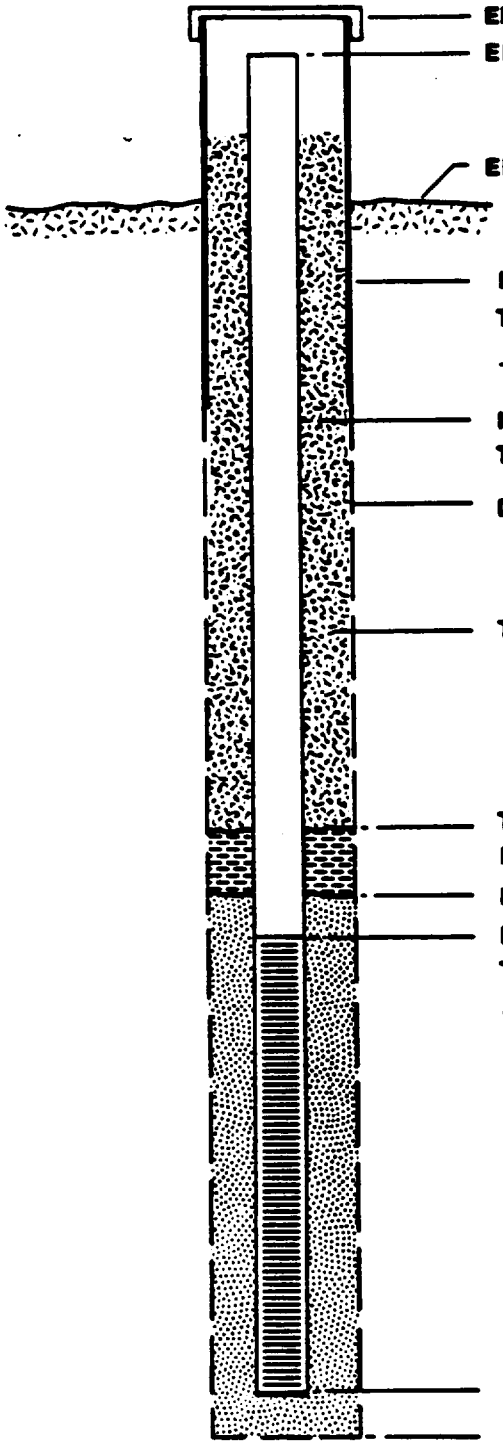
SUMMARY
Earth Boring 63'
Rock Coring
Samples

HOLE NO CW14-C

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. SW-14



Elevation - Top of casing _____

Elevation - Top of riser pipe _____

Elevation - Ground surface _____

I.D. of surface casing 3"

Type of surface casing steel

I.D. of riser pipe 2.0"

Type of riser pipe Sch 40 PVC

Diam of borehole 4.0"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 18.3

Depth - Top of sand pack 22.5

Depth - Top of screen 24.0'

Type of screened section Sch 40 PVC, No. 10 slot

I.D. of screened section 2.0"

Depth - Bottom of well 29.0'

Depth - Bottom of borehole 30.0'

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1
DATE
HOLE NO. SW14-M
LINE & STA.
OFFSET
SURF. ELEV.

TO Weston Geophysical Corporation | ADDRESS Westboro, Mass
PROJECT NAME Economic Planning Group | LOCATION Woburn, Mass
REPORT SENT TO above | PROJ. NO.
SAMPLES SENT TO Taken at Site | OUR JOB NO. 86-163

GROUND WATER OBSERVATIONS
At ____ after ____ Hours
Top of Ground
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	HW	NONE	
Size I D.	4"		
Hammer Wt	300#		BIT
Hammer Fall	24"		

	Date	Time
START	11/15/85	a.m. p.m.
COMPLETE	11/15/85	a.m. p.m.
TOTAL HRS.		
BORING FOREMAN	R. Eastwood	
INSPECTOR		
SOILS ENGR.		

LOCATION OF BORING: Swamp - Drove HW casing

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	To 6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc	SAMPLE No	Pen	Rec
		No Samples							General description of soil from wash - Brown fine SAND, trace of silt & cobbles			
								30'				
									Bottom of Boring 30' Installed 2" Sch 40 PVC O.W. @ 33'			

GROUND SURFACE TO 30' USED 4 "CASING: THEN Installed O.W.

Sample Type
D=Dry C=Cored W=Washed
UP=Undisturbed Piston
TP=Test Pit A=Auger V=Vane Test
UT=Undisturbed Thinwall

Proportions Used
trace 0 to 10%
little 10 to 20%
some 20 to 35%
and 35 to 50%

140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density		Cohesive Consistency		
0-10	Loose	0-4	Soft	30 + Hard
10-30	Med. Dense	4-8	M/Stiff	
30-50	Dense	8-15	Stiff	
50 +	Very Dense	15-30	V-Stiff	

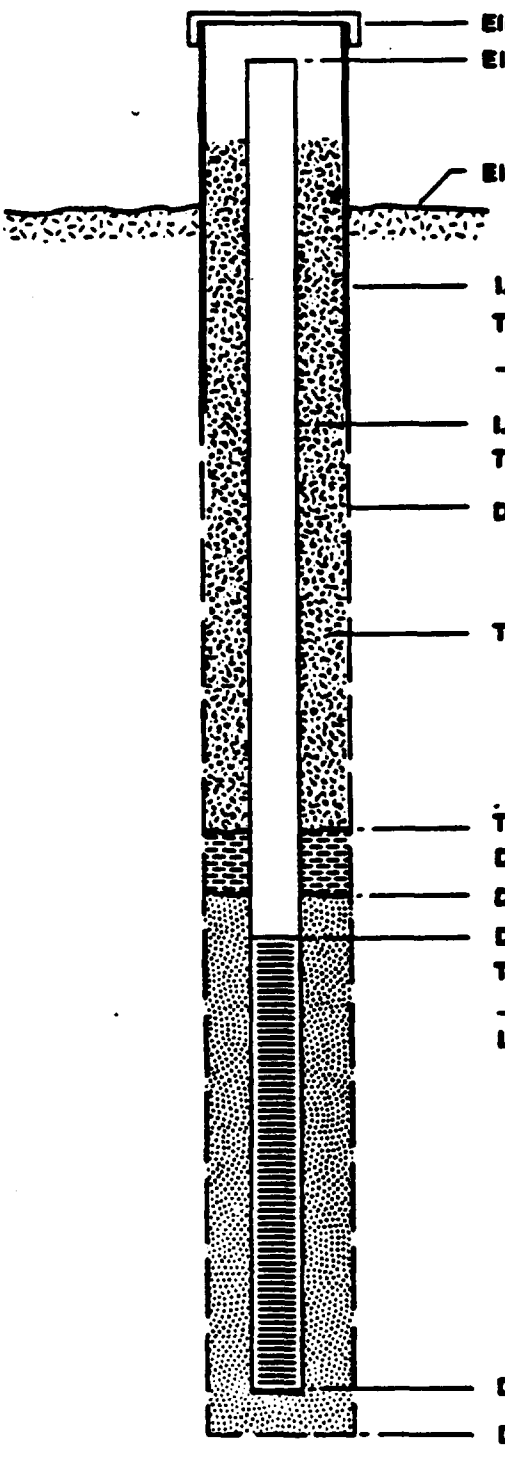
SUMMARY:
Earth Boring 30'
Rock Coring
Samples

HOLE NO W14-M

TOWN PRESS - EAST PROV.

INSTALLATION REPORT

MONITORING WELL No. OW-9



Elevation - Top of casing 47.68

Elevation - Top of riser pipe —

Elevation - Ground surface 45.25

I.D. of surface casing 3"

Type of surface casing Steel

I.D. of riser pipe 2"

Type of riser pipe Sch 40 PVC

Diam of borehole 4"

Type of backfill Natural

Type of seal Bentonite Pellets

Depth - Top of seal 0.0

Depth - Top of sand pack ~5'

Depth - Top of screen 3.0

Type of screened section

Sch 40 PVC Dia 10 slot

I.D. of screened section ~2'

Depth - Bottom of well 13.0

Depth - Bottom of borehole 14.0